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EDMUND BURKE, THE FARMER

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Edmund Burke is remembered primarily as a political and literary figure who was interested in the problems of America, India, Ireland, and France. Students of English history also recall details of his efforts to provide intellectual leadership for the Rockingham Whigs and his involvement in the intricate backstage party maneuverings of the time. Less well known is the fact that Burke, like many of the leading men of his generation, engaged in farming as a serious pursuit.¹ In this respect, he has not attracted much notice, although anyone acquainted with his life knows that he possessed an estate in Buckinghamshire. It is, therefore, the purpose of this article to delineate Burke's farming activities and the zeal and scientific purpose with which he pursued them. His various experiments in husbandry were in harmony with the spirit of the age and were deemed of sufficient importance by Arthur Young to be recorded in his *The Farmer's Tour through the East of England*.

Burke purchased his estate of some 600 acres near Beaconsfield in 1768. How he financed the transaction is still a matter of doubt. This much is certain—to his old schoolfellow, Richard Shackleton, he wrote, "I have made a push, with all I could collect of my own, and the aid of my friends, to cast a little root in this country."²

¹ For a discussion of the enthusiasm for agriculture at this time, see Paul H. Johnstone, "Turnips and Romanticism," *Agricultural History*, 12:224-255 (1938). Some of the aristocrats who embraced farming did so because they deemed it the fashionable thing to do whereas others were sincerely devoted to the betterment of rural England. In the words of the famous chronicler, James Boswell: "An ordinary gentleman farmer will be satisfied with looking at his fields once or twice a day. An enthusiastical farmer will be constantly employed on them, will have his mind earnestly engaged, will talk perpetually of them." *Boswell's Journal of a Tour to the Hebrides with Samuel Johnson, LL.D.*, ed. by Frederick A. Pottle and Charles H. Bennett, 81 (New York, 1936).

² *Correspondence of the Right Honourable Edmund Burke*, ed. by Earl Fitzwilliam and Sir Richard Bourke, 1:153 (London, 1884).

Beyond Burke's own statement, there is little agreement. To determine how much money Burke had of his own, how much he borrowed from friends, and who these friends were, whether Rockingham, Earl Verney, Dr. Richard Huck Saunders, or all of them, would require special investigation which even then might not remove all dispute.³

The market town of Beaconsfield was 23½ miles from London on the Oxford road. Strictly speaking, Burke's estate was called Gregories and was a portion of the manor owned by the seventeenth-century poet, Edmund Waller. Burke dated his correspondence variously from Beaconsfield, Beconsfield, Gregories, or Butler's Court. The home was built by Mrs. Martha Gregory who was buried at Beaconsfield in 1704. Burke improved the house, and contemporary engravings show it to be an imposing structure. The square two-story central residence was at the top of a flat mound, at either end of which were smaller two-story structures. They were joined to the main building by "splendid colonnades which gave it, at a little distance, the dignity of a Royal residence in miniature."⁴ Young found the house set in an agreeable park, with pleasant views especially from the north front which overlooked a large extent of country with magnificent woods in the distance.⁵ Here Burke lived in the summers

³ For the contradictory evidence on this subject, see James Prior, *Memoir of the Life and Character of the Right Hon. Edmund Burke*, 3, 106-109 (ed. 3, London, 1839); Peter Burke, *The Public and Domestic Life of the Right Hon. Edmund Burke*, 103-104 (ed. 2, London, 1854); John Morley, *Burke*, 46-51 (London, 1923); Robert H. Murray, *Edmund Burke, A Biography*, 161 (Oxford, 1931); Robert Bisset, *The Life of Edmund Burke*, 155 (London, 1798); George Lipscomb, *The History and Antiquities of the County of Buckingham*, 3:191 (London, 1847); *Annual Register*, 1798, p. 328. Prior gave the purchase price as "above £20,000"; Burke, £23,000; Murray, £20,600; Morley, "upwards of twenty-two thousand pounds."

⁴ Lipscomb, *Buckingham*, 3:191.

⁵ Arthur Young, *The Farmer's Tour through the East of England*, 4:84 (London, 1771).

and between sessions of Parliament, and here he kept good cheer for his many notable friends, including Samuel Johnson who spent six days with him in 1774. With the property Burke had to take the previous owner's collection of marbles and paintings. This raised the purchase price, but Burke seemed to feel some pride in possessing them.⁶ Young said it was a fine collection and so did James Boswell, who remarked upon the "rich-gilded" frames of the paintings. Sir Joshua Reynolds valued the seven landscapes by Poussin at £700.⁷

When Burke acquired Beaconsfield, he avowed to Shackleton that "I propose (God willing) to become a farmer in good earnest."⁸ Burke lost no time in demonstrating his enthusiasm by farming and improving the estate. In 1769 he wrote to Rockingham that Thomas Whately, an authority on landscaping, was then with him, and though Whately's mission was political in nature, it may be assumed that problems of gardening did not go unmentioned.⁹ It seemed that landscaping was on his mind at this time, for two months later Burke wrote to Rockingham that he did not like Temple's new gardens at Stowe—they "had been improved upon two very different ideas."¹⁰ But the estate was to be more than a hobby, for Burke could not afford hobbies. He had no sooner acquired Beaconsfield than he invited David Garrick for a visit, assuring him that the fowl, beef, and mutton would be of his own raising.¹¹ From this time forward, Burke applied himself to the science and business of husbandry "with so much assiduity, that he very soon astonished the literary circle amongst whom he had been accustomed to move, by his improvements at Gregories, which soon presented a very

⁶ Prior, *Memoir*, 107.

⁷ Young, *Tour*, 4:84; James Boswell, *Private Papers of James Boswell from Malahide Castle in the Collection of L't. Col. Ralph Heyward Isham*, ed. by Geoffrey Scott and Frederick A. Pottle, 15:202 (privately printed, 1928-1936).

⁸ Burke, *Correspondence*, 1:154.

⁹ *Ibid.*, 186. Whately, a well-known political figure, was a member of Parliament from 1761 to 1772. He published anonymously *Observations on Modern Gardening* in 1770.

¹⁰ Burke, *Correspondence*, 1:208. For Burke's influence upon landscape gardening, see Isabel Wakelin Urban Chase, *Horace Walpole: Gardenist*, 92-93, 143, 147, 205 (Princeton, N. J., 1943).

¹¹ Donald Cross Bryant, *Edmund Burke and His Literary Friends*, 139 (St. Louis, 1939).

different character from that plain sombre habitation, when he first took possession of it."¹²

The most satisfactory accounts of Burke's farming activities, especially as revealing his zeal and scientific attitude, are to be found in Young's *Tour* and in Burke's own correspondence with Young. The experiments recorded in these two sources may not always have been conclusive, but their success or failure is less important than the fact that they were undertaken. Moreover, Burke's interest in experimentation did not diminish his efficiency and economy. He used his coach horses for the business of the farm and supplied his table both in the country and in London with products of his own raising. Young found that Burke was on the whole much more progressive than his Buckinghamshire neighbors. For example, the farmers in the vicinity of Beaconsfield were backward in their use of fertilizer and knew "nothing of draining in this country,"¹³ but such accusations could not be made against Burke.

According to Young, 160 acres of Burke's estate was grass, 160 arable, and 90 wood. The arable acreage was divided as follows: wheat, 40; barley, 25; clover, 25; turnips, 25; oats, 16; peas, 16; vetches, 8; carrots, 2; potatoes, 2; and cabbages, 1. Young gave the rental as £250. There were 6 horses, 14 cows, 6 young cattle, and 40 swine. The labor force was made up of 1 man, 2 boys, and 6 laborers.¹⁴

After this general survey, Young then inquired about the various experiments Burke was conducting. The first to be noticed was the one concerning the use of carrots as feed for swine. In 1769 Burke sowed an acre of carrots in a gravelly-loam soil. The seeding was late, the ground not well-prepared, and the crop not good. Burke fed carrots to two pigs for two months, but they did not fatten until he put them on barley meal. Burke was not disheartened, for "He is but a poor husbandman, who is discouraged by one year's ill-success, where he acts upon good authority or pursues a rational principle."¹⁵ So in the spring of 1770 he tried 2 acres of carrots in better soil that had been fallowed the preceding year.

¹² Lipscomb, *Buckingham*, 3:191.

¹³ Young, *Tour*, 4:71-73.

¹⁴ *Ibid.*, 77. Lipscomb, *Buckingham*, 3:191, says Burke trebled the value of his estate "by the activity of his genius," and Prior, *Memoir*, 201, placed the rental at £600 in 1778.

¹⁵ Burke, *Correspondence*, 1:246.

Young also recorded other details. The ground had received 3 plowings, was dressed with 30 loads of "rotten dung" during the winter, then plowed 16 inches deep in January 1770, harrowed in February, and sown with 4 pounds of seed per acre. During the summer there were 2 hand hoeings at an expense of 30 shillings per acre, and the plants were thinned to 8 inches. The crop was good, and it was harvested in October. The expense of digging and cleaning the carrots was 7s. 6d. per load of 50 bushels.¹⁶ Burke wrote that he sold 2 wagonloads in London for £6 15s., and "the back-carriage of coal-ashes has paid my charges."¹⁷ He felt that carrots were more profitable than wheat.

Now for another trial at feeding carrots to swine. Burke fed some pigs on barley meal and some on boiled carrots; the first group fattened, the second did not. It was at this time—late in 1770—that Young visited Beaconsfield, and he and Burke put their heads together on the problem. The latter was dubious about the length of time the carrots had been boiled—maybe he had boiled them too much, maybe too little. Young was puzzled—perhaps carrots are satisfactory for bacon hogs, perhaps swine merely fatten more slowly on carrots—but he was not prepared to give a final verdict.¹⁸ Burke was not willing to admit defeat, for "The price of barley and peas is this year so high, that I should wish to persevere, if there was the least chance for succeeding; as I have a very great quantity of carrots, and the London market will take off only those which have a handsome appearance." After leaving Beaconsfield, Young asked for more data on the carrot experiment. Burke replied that he could not give him all the information desired because "It is scarcely possible for me, with my numerous avocations, to get my servants to enter fully into my views upon these subjects." Nevertheless he was going to plant carrots again in 1771, for he thought, "I got more by them than I could have done by the best crop of wheat," and the land devoted to carrots paid the best, in proportion, of any on the farm.¹⁹

¹⁶ Young, *Tour*, 4:77-78.

¹⁷ Burke, *Correspondence*, 1:247.

¹⁸ Young, *Tour*, 4:79, 507.

¹⁹ Burke, *Correspondence*, 1:247-249, 258. On the whole, Young was impressed by the many experiments with carrots, and he believed they were a profitable crop. *Tour*, 4:93-112, 507-511. He did not agree with J. S. Morritt who asserted in an account of an experiment with carrots in Alexander Hunter, *Geographical Essays*, 1:141-148 (York, 1803), that "we should not

In the matter of deep plowing, Burke had better success. He plowed 10 to 12 inches, or double the usual depth. His surprised bailiff said the crops would be ruined, yet Burke's products were better than those of his neighbors. On this subject Burke had very definite theories which he propounded to Young.²⁰ Plowing, he said, serves several purposes. It divides the soil, enables plants to push through the earth and roots to spread, and admits moisture, sunlight, and air more readily. In heavy soil, deep plowing would seem to accomplish these purposes best. There were, however, several questions which experimentation alone could answer. Is it always good that roots should spread without limit? Perhaps too much of the plant would go to root. Is looseness of the soil beneficial for all plants? Are the benefits of rain, sun, and air equally good at all depths—that is, might there not be too much of a good thing? Is there the possibility that deep plowing would stir up certain noxious elements in the soil? Burke did not know the final answers, but he admitted that all these doubts were worthy of consideration. The questions he raised prove that he had given serious thought to the problem of deep plowing.

There were still other experiments. Burke had considerable success with cabbages from seed sent by Young. The cows gave much milk after being fed on cabbages, and the butter was good, being equal to May butter in color, smell, and flavor. Burke believed the indifferent results obtained by some persons from feeding cabbage to cows might have been due to the variety of cabbage used. His was leafier, and he believed the cabbage which went to head earlier was ranker than the leafy kind. Nevertheless he was willing to try the headed variety. In September 1771, he had 2½ acres of it, which he had planted in staggered fashion so that fodder would be available from January until the pasture season.²¹ There is no indication in his later letters of the outcome of this trial.

An example of experimentation combined with capital improvement was Burke's drainage project. On 10 acres too wet for crops, Burke cut drains 18 inches deep and 3 inches wide at the bottom. These ditches were filled with chalk

depend upon carrots *alone* for fattening of hogs." These essays were originally written by members of the York Agricultural Society in 1770.

²⁰ Young, *Tour*, 4:79; Burke, *Correspondence*, 1:262-265.

²¹ *Ibid.*, 250, 258-259.

stones or bushes, and when Young visited Beaconsfield this field was "quite dry." An experiment with drilled beans "for cleaning land when out of order, instead of a fallow" worked well. A "very foul" field of loamy soil was drilled with beans in rows 18 inches apart. The crop was poor but the field was "perfectly cleaned by them." As for fertilizer, Burke found that pigeon dung proved best, then rabbit dung, and last, yard dung. Ashes, however, were the best fertilizer for grass land. Burke used oxen for plowing, and his experience showed that 3 oxen and 1 horse, or 4 oxen would plow an acre a day. This was as much as 4 or 6 horses could do and at only half the cost.²²

What Burke was doing for the agriculture and the people of his neighborhood was only what many men were doing in other parts of England. Young, of course, had nothing but praise for such efforts. Of Burke, he said, "His country is much indebted to him for giving so laudable an attention to the improvement of her husbandry."²³ Burke was gratified when Young mentioned the experiments in his *Tour*, although Burke himself was more modest about the value of "my feeble infantine attempts in husbandry."²⁴ His interest in experimentation did not make Burke any the less practical, for "as a farmer he was the most successful of the neighbourhood, without any unusual expence."²⁵

Young's account deals with Burke's activities during the first several years after he acquired Beaconsfield. Burke's interest at that time was not a mere first flush of enthusiasm; his ardor for agricultural pursuits did not diminish throughout the remainder of his life. It was a "luxury" for Burke, after the "noise, heat, and drudgery of the House of Commons," to be able to retire to the country and to relax from his political labors by renewing his preoccupation with his farm.²⁶ A brief glance through his correspondence reveals a high proportion of the letters written from the country. Occasionally he dropped incidental remarks about his farming. On July 19, 1773, he told Rockingham about the "terrible havock" wrought by a storm in the midst of the harvest. Two months later he informed Rockingham that

²² Young, *Tour*, 4:80, 82; Burke, *Correspondence*, 1:261.

²³ Young, *Tour*, 4:84.

²⁴ Burke, *Correspondence*, 1:258.

²⁵ *Annual Register*, 1798, p. 329.

²⁶ Prior, *Memoir*, 119.

the harvest was well in, but the yield in flour was not extraordinary.²⁷ He delighted in walking about the fields with a spade, digging up plantain roots and tenderly manuring the spots where the grass might be injured. He invariably took his frequent visitors on inspection tours about his farm, and one may be sure that Sir Joshua Reynolds was well known to Burke's tenants.²⁸

Boswell, who visited Beaconsfield on April 21, 1783, also left an account of Burke's farming activities, in which he bore witness to the improvements Burke had made upon his farm.²⁹ Unfortunately, Boswell was called back to London in the midst of a sentence describing Burke's course of farming, but the unfinished statement deserves quotation. "The soil here is gravelly and bears a beautiful verdure; and the ground is formed into swells and hollows as if in a Mould by an exquisite Artist. He begins his husbandry course by dunging his land well, and then sowing barley with clover and rye grass. Next year it is in hay, of which he takes one crop or two, according as the season is. He then fallows and sows turnips, or takes a crop of . . ." Had he continued, Boswell might have given some judgments about Burke as a farmer.

When Burke confided to Boswell that a country place would be a comfort and a haven to anyone in his old age, he did not realize how true that was to be of himself. During his last years, Burke needed solace. The French Revolution alarmed and embittered him. He was pessimistic about the future; the old order seemed to be tumbling about his ears, for the constitution, the Church, and society as Burke wanted it seemed on the verge of being overturned. Old friendships, like that with Charles James Fox, were broken; old party ties were dissolved. In 1794 Burke retired from Parliament. On August 2 his only child, Richard, died, and Burke was nearly prostrated. Two years later he confessed he had not dined away from home since the tragedy had occurred. In these years, farming was Burke's only diversion, except the school for émigré children that he was sponsoring.³⁰

Of course, Burke did not entirely lose his interest in public affairs. In 1795 he wrote *Thoughts and Details on Scarcity* giving his views on the rôle of

²⁷ Burke, *Correspondence*, 1:434, 445.

²⁸ Bryant, *Edmund Burke*, 71.

²⁹ Boswell, *Private Papers*, 15:202.

³⁰ Prior, *Memoir*, 504; Young, *Autobiography*, 257.

the state in the economic life of a nation. Burke held with Adam Smith that the government can do little good but much harm by intervening in the economic activities of individuals. Whatever is "truly and properly public" is within the domain of the state, but "whatever remains will, in a manner, provide for itself."³¹ Included in that remainder would be production and distribution, buying and selling.

This brief work has another interest, however. In it Burke noted much about agricultural affairs, revealing how, in his last declining years, he was still a farmer at heart. For "seven-and twenty years . . . I have been a farmer" he said, and the statement is no exaggeration. He devoted several pages to a discussion of planting, harvesting, condition of crops, and market prices. He told how he sold his wheat from the harvest of 1794 at £14 a load, whereas, if he had waited, he could have had 30 guineas. The winter of 1794-95 was unfavorable for wheat due to the alternating frosts and rains. The result was a rise in prices, since, as Burke thought, prices are determined by "the balance between consumption and production."³² As for other crops, barley was excellent, clover "the finest I remember to have seen," turnips were good, oats abundant, and Burke's acre of "pease"

produced a crop that "was great indeed." Coming through the market town of Uxbridge, Burke, as was his practice, inquired about prices, but he "forgot to ask about pease." The price of meat was high, while fowls were dear, having "followed the fortune of the season." Burke sold 6 fowls to a dealer for 24 shillings, "fowls for which two years ago the same man would not have given a shilling apiece."

Young visited Burke on May 1, 1796 and was "shocked to see him so broken, so low, and with such expressions of melancholy."³³ After breakfast they walked about the farm for five hours. Young "was glad to find his farm in good order." Burke's conversation was "remarkably desultory," but much of it centered around agriculture. Thus, late in life and just a year before his death, Burke was as much absorbed in farming, as much a farmer at heart, as when Young had visited Beaconsfield twenty-five years before. Burke was not a Townshend, a Tull, or a Bakewell, and his experiments did not produce results that appreciably changed English agriculture, but amidst all his cares and labors, he found time for farming, he knew much about it, and he made it pay. In that sense he was in harmony with the spirit that produced the revolution in eighteenth-century English agriculture.

³¹ Edmund Burke, *Works*, 5:166-167 (Boston, 1884).

³² *Ibid.*, 151, 157-167.

³³ For the visit, see Young, *Autobiography*, 257-261.

IMMIGRANT SETTLEMENTS IN SOUTHERN AGRICULTURE

A COMMENTARY ON THE SIGNIFICANCE OF CULTURAL ISLANDS IN AGRICULTURAL HISTORY

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The frontier and the West have been looked upon as almost synonymous in the history of the United States. The heavy and persistent migrations to the West obscured some important longitudinal migrations to other frontiers in the North and South. After the Civil War, there began a rather persistent migration from the South to Northern States, a migration which in the course of time was stimulated more and more by industrial and urban opportunities. On the other hand, as the frontiers of the West were disappearing, frontier-like areas were opened in the South, and the same advertising technique that had been used to bring homeseekers to the West and to keep them from crossing the Mason and Dixon line was

used to bring prospective farmers to the South.¹ The South was no longer the "Black Belt" or the "Malarial Belt" but the "Sunny South." Agricultural opportunities were described as widespread.

Much of the advertising literature designed to bring prospective land buyers to the South pertained to certain frontier-like sections which were developed in part or mainly after 1895. Among these are: the Cumberland Plateau of Tennessee and Alabama, particularly the Sand Mountain area of Alabama; the lower Coastal Plain of Alabama

¹ See, for example, Walter L. Fleming, "Immigration to the Southern States," *Political Science Quarterly*, 20:276-297 (1905).

and adjacent States; the flat claypan rice-growing sections of Louisiana, Arkansas, and Texas; the fruit and truck sections of Florida; the irrigated fruit and truck areas in the Rio Grande Valley; the newly cleared and drained lands along the lower Mississippi River; the uplands in the Arkansas Valley of Arkansas; and some thinly populated lands in central and western Oklahoma and Texas. These frontiers were created by such various developments as the coming of railroads, lumbering operations, the introduction of commercial fertilizer, machine techniques in rice production, irrigation, drainage, and the rapid expansion of commercial fruit, truck, and poultry farming.

Competition with available farm lands elsewhere gave rise to varied promotion schemes designed to attract farmer immigrants to the Southern frontiers. State governments, railroads, lumber companies, chambers of commerce, and land companies participated in advertising programs. Immigration bureaus or agricultural departments to promote immigration of farmers are still maintained by some of the Southern States.

There are those who hold that Southern real-estate promoters directed much of their attention to Northern farmers in post-Civil War days because it was assumed that farmers in thriving agricultural sections commanded capital that could be invested in land purchases and so provide ready and liberal profits to land agents. While this is true in part, it must also be remembered that railroads, for example, disposed of large holdings during the same time, and these companies were naturally interested in agricultural developments along their routes. These companies directed their appeal to prospective buyers in various sections of the United States and also to European countries. At least up to about 1900, as many immigrants came to the South from European countries as from the North. The immigrants from Europe usually came with limited amounts of capital, and their initial investments in land were frequently meager. In more recent decades, real-estate promoters in all sections of the country gave special attention to the relatively well-to-do Corn Belt farmers. Obviously this attention brought results, because settlements of Middle Westerners can be found from the coastal plains of Maryland and Florida to the mountain valleys of the Pacific Coast States.

Some of the literature prepared by railroads and other agencies stressed the need for new forms of farming in the South and pointed out the real opportunities awaiting farmers who pioneered in

non-cotton types of farming. By direct statements and by implication it was made clear that immigrant farmers were expected to engage not in cotton farming but in specialty-crop production or in general farming. The fact that agriculturists and land promoters in the South hoped to diversify local agriculture by introducing Northern farmers and European peasants suggests a number of interesting questions. Why didn't the cotton farmer diversify his agriculture? What basis was there for the assumption that immigrant farmers would bring a different farming program rather than adopt the prevailing cash-crop farming already established in the South? Apparently, here was at least a partial recognition of the persistence of familiar agricultural patterns. This recognition could not have been based on geographical and agricultural literature because writers in these fields explain types of farming chiefly in terms of physical factors and economic considerations.

At present there are numerous settlements in the South with non-Southern agricultural backgrounds which carry on farming programs that depart in varying degrees from the types of farming traditional in the area. In some instances one or several new crops were introduced and proved successful. In other instances new ways of producing established crops created new opportunities. Even where new crops were not introduced, tell-tales of immigrant settlements remain in one or several of the following forms: the type and quality of farm improvements; a good live-at-home program; relatively low incidence of tenancy; small relief rolls during the depression of the early 1930s; a high degree of participation in manual work by farm operators; and absence of reliance on supply and credit merchants.

It is a remarkable fact that immigrant settlements faced and accepted complete failure if modified or new programs of farming were not worked out. At least no settlement has been found by the writer in which the immigrants had merged completely with the prevailing agricultural economy. Instead, they had sold out and moved away. The partial or complete failure of some of the settlements in these new frontiers in the last fifty years resulted not so much from poor farming techniques as from the fact that there were no known farming methods that could sustain numerous farmers with a good standard of living on some of the poor lands of the South.

A list of settlements in the South reflecting non-Southern agricultural backgrounds follows. The

available data on each settlement are arranged thus: location; ethnic group, its religion, and the approximate time of settlement; and its farming enterprises.

Alabama. Baldwin County on the Coastal Plain: Middle Westerners, Germans, Italians, and Scandinavians, religions varied, 1900 and after; general and truck farming and specialties. Cullman County on the Cumberland Plateau: Germans, Catholic and Lutheran, after the Civil War; strawberries, sweetpotatoes, cotton, corn. St. Florian on the Highland Rim: Germans, Catholic, after the Civil War; general and truck farming.

Arkansas. Coastal Plain. Stuttgart and environs: Middle Westerners (Germans, Bohemians), Catholic, Lutheran, and others, late nineteenth century and later; rice and general farming. Weiner and environs: Middle Westerners (Germans), Catholic; rice and general farming. Arkansas Valley (mostly on uplands). Altus: Germans, Catholic, late nineteenth century; grapes, fruit, stock, dairying, poultry. Augsburg and Lutherville: Germans, Lutheran, late nineteenth century; poultry, cotton, dairying, corn, truck. Dardanelle: Czechs, Catholic, late nineteenth century; dairying, cotton, poultry, corn. Morrilton and Atkins: Germans, Catholic, late nineteenth century; cotton, poultry, dairying, truck, corn. Solgahachia: Italians, Catholic, late nineteenth century; sweetpotatoes, cotton, corn, poultry, dairying, grapes. Subiaco: Italians, Catholic, late nineteenth century; potatoes, poultry, cotton, dairying, grapes, corn.

Florida. Coastal Plain: Middle Westerners and others, religions varied, 1900 and after; citrus fruits, vegetables, poultry.

Louisiana. Coastal Plain. Albany: Hungarians, after World War I; strawberries, truck crops. Alexandria: Belgians, after the Civil War; potatoes, cotton, general farming. Crowley and southwest Louisiana: Middle Westerners, religions varied, 1885 and after; rice and general farming. Hammond: Italians, Catholic; strawberries. Kolin and Libuse (crawfish land): Middle Westerners (Bohemians), Catholic, World War I and after; oats, sweetpotatoes, dairying, general farming.

Mississippi. Glueckstadt on the Coastal Plain: Middle Westerners (Germans), Catholic, after 1900; dairying and general farming.

Missouri. Southeast or Swampeast Missouri of the Coastal Plain: Middle Westerners and others, after 1900; general farming, cotton.

North Carolina. Castle Hayne and St. Helena

on the Coastal Plain: Dutch, Germans, Italians, and Poles, Catholic and other religions, after World War I; truck crops, bulbs, flowers. Ridgeway on edge of the Piedmont: Germans, Lutheran, after the Civil War; cantaloups, cotton, corn, berries, legumes.

Oklahoma. Central Lowland. Buffalo and Shattuck: Middle Westerners (Germans), Lutheran and Adventist; wheat, livestock, sorghums. Corn and Bessie: Middle Westerners (Germans), Mennonite and Lutheran; wheat, cotton, sorghums, livestock. Lahoma: Middle Westerners (Germans), Lutheran; wheat, livestock. Lincoln County: Czechs, 1891 and after; cotton, general farming. Thomas and Fay: Middle Westerners (Germans), Mennonite; wheat, livestock, sorghums.

Tennessee. Deer Lodge on the Cumberland Plateau: Poles, after World War I; potatoes, general farming. Gruetli on the Cumberland Plateau: German-Swiss, Reformed, after the Civil War; potatoes, general farming. Wartburg on the Cumberland Plateau: Germans and German-Swiss, Lutheran, 1845-50; potatoes, truck crops, general farming. Franklin County (limestone soil) on the Highland Rim: German-Swiss, Reformed, after the Civil War; general farming, crimson clover, potatoes. Loretta and St. Joseph on the Highland Rim: Germans, Catholic, after the Civil War; general and truck farming. Cocke and Greene counties of the Ridge and Valley: Pennsylvania Germans, Lutheran, about 1800; tobacco, dairying, wool, general farming.

Texas. Bell County (eastern part) Coastal Plain: Czechs. Lower Rio Grande Valley, Coastal Plain: Middle Westerners and others, after 1900; citrus fruits, vegetables. Fredericksburg, New Braunfels, and environs, of the Coastal Plains and Southern Great Plains: Germans, Catholic and Lutheran, 1845 and after; cotton, grazing, poultry, general. Upper Panhandle of Southern Great Plains: Middle Westerners, after World War I; wheat, grazing.

Not all of the settlements listed have been visited by the writer, nor have most of them been studied.² It appears, however, that they, individ-

² For general descriptions of many of these settlements, see Walter M. Kollmorgen, "A Reconnaissance of Some Cultural-Agricultural Islands in the South," *Economic Geography*, 17:409-430 (1941), "Agricultural-Cultural Islands in the South: Part 2," *ibid.*, 19:109-117 (1943), and "Observations on Cultural Islands in Terms of Tennessee Agriculture," East Tennessee Historical

ually and collectively, are significant in that their farming enterprises usually differ from those traditional in the area, and frequently new crops have been introduced. Moreover, relatively high living standards are maintained. In a number of these settlements we find the genesis and development of agricultural type areas described in such a publication as *Types of Farming in the United States* issued by the United States Bureau of the Census in 1933. Studies of these settlements therefore should be helpful in understanding the dynamics of agriculture as well as give a better understanding of the significance of folkways in farming activities.

Since many agricultural innovations in the South in the past were effected by immigrant groups, and a number of newly developed areas were largely taken over by these people, the question arises, What of the future? If new forms of farming become widespread on larger and more highly capitalized farms, who will man these farms? Moreover, if new frontier-like areas are developed, who will take over the land? No categorical answer can be given to these questions, but it is clear that the heavy hands of culture and tradition, the absence of proper techniques, and the absence of capital have in the past frequently served to reserve these opportunities to non-Southern farmers. Pressure for new land and new farming opportunities—problems which are more critical in the South than in other sections of the country—have not in themselves caused Southern farmers to appropriate several of the recent frontiers in the South or to develop the new forms of agriculture now found there.

The innovations made by immigrant farmers in the South are many and varied, and only a limited number can be briefly reviewed here. In some instances a small group of immigrants, consisting perhaps of several families, made major contributions to a new type of farming that became widespread; in other instances new methods of farming became largely the exclusive occupation of immigrant groups. Unlike settings as well as unlike financial and technical requirements account in part for these differences.

A good illustration of the first type is the

Society, *Publications*, 16:65-78 (1944). Detailed studies of these settlements are yet limited in number. Two are cited in footnotes 8 and 9. See also Russell Wilford Lynch, "Czech Farmers in Oklahoma," Oklahoma Agricultural and Mechanical College, *Bulletin*, 39(13):1-119 (1942).

strawberry, truck, and cotton area around Humboldt, Tennessee.³ In 1862, two men, sometimes referred to as Dutchmen and sometimes as Yankees, came to northwest Tennessee, and in a few years they were growing grapes successfully. These, however, were difficult to market, and so they planted strawberries which they heard brought fabulous prices on northern markets. The results are described in part in the following quotation:

So, in 1867, the idea of commercial Strawberry culture was born in West Tennessee. And the following spring, the first Strawberry plants ever to be set south of the Ohio River were placed in the soil near Humboldt. Thus did the Strawberry find its way into Dixie. And the humble little "strawberry" as the wild variety of the plant was called years ago, grew into a million dollar industry. Humboldt became the Strawberry capital of the nation. The fame of the Strawberry passed on into other Southern states until eventually many areas copied after the two Dutch boys who "came South" and who despite a Civil War, the obstacles of nature, and man-made marketing and transportation facilities of the time, put into effect a change in the economical routine of the day that has existed throughout intervening time.⁴

Once the intensive farming methods associated with strawberry culture had become familiar in the Humboldt area and marketing relations had been established with Northern cities, the introduction of truck crops, including sweetpotatoes, followed quite naturally. Today this area is one of the outstanding strawberry and truck crop centers of the South, although cotton and corn are also produced in large quantities.

This illustration of what a few families can do to the agriculture of an area is by no means unique. About 200 miles south of Humboldt, Tennessee, lies Copiah County, Mississippi, also one of the outstanding truck-farming centers of the South.⁵ Up to the latter part of the nineteenth century, it was a typical cotton county with little or no crop diversification. Then came a few Italian and German settlers who began to experiment with truck crops, and their efforts were successful. After these demonstrations, dispersion of truck

³ Type 291 on pocket map in U. S. Bureau of the Census, *Types of Farming in the United States* (1933).

⁴ A. H. Williams, "Origin of Strawberries in the South," *Courier-Chronicle*, Golden Anniversary Supplement (Humboldt, Tenn.), May 21, 1942, p. 32.

⁵ Type 295 on pocket map in *Types of Farming in the United States*.

farming took place among the native farmers. Today Copiah County sends large shipments of early vegetables, particularly tomatoes, to Northern markets.

While the above innovations made by a limited number of individuals resulted in rather widespread changes in types of farming, there may have been other successful innovations and operations by individuals that were not duplicated so generally or, in a good many instances, may not be known because no careful inquiry has been made. A search in the South may readily lead to discovery of many scores and even hundreds of immigrant farmers whose operations do not fall into the generally established framework of Southern agriculture. Large dairy farms and truck farms are particularly likely to be activities of nonnative operators.

More spectacular than the infiltrations by individuals are the mass migrations of Northern farmers to some of the newer specialized farming sections of the South. Important among these are the citrus and truck crop section of the lower Rio Grande Valley, the rice section of southwest Louisiana and east central Arkansas, the early truck crop section in the Mobile area of Alabama, and the various specialty farming areas of Florida, which include poultry, citrus fruit, and truck crop production. Collectively, many thousands of Northern farmers have established themselves in these various places and have developed new types of farming in the South. As recently as 1939, for example, the Louisville-Nashville Railroad transported about 3,000 farm people from the Northern Great Plains to the Mobile area of southern Alabama. This migration into the Southland is rather striking in view of the fact that the South and the Southeast have a surplus farm population estimated at about 33 percent. The large migrations to Florida, to the rice lands of Louisiana and Arkansas, and to the lower Rio Grande Valley came several decades earlier, but also at a time when the economic base for most Southern farmers was already considered entirely inadequate.

One of the outstanding examples of large-scale migration of Northern farmers to the Deep South occurred in connection with the development of rice farming in Louisiana and Arkansas.⁶ These rice lands are flat and underlain by a claypan which makes them eminently suitable for irrigation and rice culture. Agriculturally these lands re-

mained largely undeveloped until late in the nineteenth century or later. Some rather haphazard grazing activities were carried on by local people. Because of the cover of grass rather than trees on these lands, the section in Arkansas is generally referred to as the Grand Prairie and the one in Louisiana as the Coastal Prairie.

The genesis of the large-scale production of rice on the Coastal Prairie of Louisiana is described in part as follows:

A certain Mr. Watkins of Iowa, with the aid of English capital, purchased approximately a million and a half acres of land in southwestern Louisiana, and in 1884 secured Dr. Seaman A. Knapp, then Professor of Agriculture in Iowa State College, and later a prominent official of the Department of Agriculture, to assist him in the development of the property. Apparently under inducements from Mr. Watkins and Dr. Knapp, farmers from the northwestern prairie states moved into this Louisiana district during 1884 and 1885; and, finding rice to have been grown there many years for home consumption, tho by primitive methods, they "commenced immediately," wrote Dr. Knapp, "to adapt the agricultural machinery to which they were accustomed to the rice industry." By the close of 1886, continued Dr. Knapp, the principal difficulties in this adaptation had been overcome.⁷

The influx of Northern grain farmers into this bonanza rice-growing section was not limited to 1884 and 1885 as the above quotation might suggest but continued for several decades until the prairie lands in southwest Louisiana were almost completely appropriated by these immigrants. Few cotton farmers participated in this development; not even the rice producers in eastern Louisiana along the Mississippi lowlands shared in this rapidly emerging type of farming. In this older rice center as well as in South Carolina and Georgia rice was produced largely by plantation methods with their heavy reliance on simple hand tools. Apparently there was no transference of technique or personnel from the old to the new centers, and the production of this grain in the old centers has almost completely ceased.

By 1900, mechanized rice production had been well established in Louisiana, and shortly afterward it was also introduced in the Grand Prairie of Arkansas. The sequence of development in Arkansas, however, differed somewhat from that of Louisiana. Prior to 1900, the Grand Prairie, in

⁶ Types 259A and 288 on pocket map in *ibid.*

⁷ Arthur H. Cole, "The American Rice-Growing Industry: A Study of Comparative Advantage," *Quarterly Journal of Economics*, 41:605-606 (1927).

particular the Stuttgart area, had been settled by a small immigrant group of German Lutherans (1878). The grazing of cattle was one of the main activities of these people who were unfamiliar with cotton culture. However, their background was such that grain farming proved popular with them, and after the introduction of rice this crop was readily adopted. Once this new activity was established, real-estate agents began a large-scale land boom. As in Louisiana, their activity was directed to the grain farmers of the Midwest. They responded by the hundreds, and in a few years the Grand Prairie became an island of transplanted Yankee farmers in the Cotton Belt. Here, as in Louisiana, few cotton farmers participated in the new development.

After rice was successfully produced by machine methods on the Grand Prairie of Arkansas, it was also introduced in the northeastern part of the State where there are similar soils. Here again, the transplanted rice culture was first adopted by a small settlement of German Catholics who were established in and near Weiner. Again, a predilection for a non-cotton type of farming was expressed by a people unfamiliar with cotton culture.

Rice farming in northeast Arkansas expanded only moderately prior to World War II but rather rapidly afterward because of the high wartime prices for this grain. Improved flood control, drainage, and land clearing are essential measures to the expansion of this enterprise. The first of these is assured under Federal sponsorship. If good prices for rice during the postwar period are maintained under some form of Federal program, several hundred thousand acres of rice land can still be developed in the northeastern part of the State. The question, therefore, arises as to who will develop this land if it is developed for rice farming.

Rice farms already developed in northeastern Arkansas as well as elsewhere in the State and Louisiana suggest the answer. Already there has been an influx of a considerable number of Middle Western grain farmers. Some of these came via southeastern Missouri, which experienced a substantial immigration of Corn Belt farmers during local land-development booms before and after World War I. Some rice farmers are leaving the Grand Prairie to buy new or larger holdings in the northeastern part of the State. Aside from these transplanted grain farmers, local bankers, lawyers, and other professional people have in recent years entered rice farming in a rather big way. They

find it necessary to hire competent help with machinery and grain-farming experience. Young men from established rice-growing areas, in particular, are in demand. While postwar rice prices may arrest this development, wartime prices are such that one or two good crops bring sufficient returns to pay for the cost of the land. If the rice producing centers in Arkansas expand, past experience suggests that the small cotton farmer in the South will not share in the development to a marked degree.

Besides the individual and rather large mass migrations to the South, there are a considerable number of group settlements in the South composed of single or multiple church communities. A good example of a single church community of immigrants is found in Franklin County, Tennessee.⁸ This settlement is an example of the more successful communities which established themselves in the South shortly after the Civil War. The farmers in this settlement have made a number of constructive innovations in the local agriculture.

Following the Civil War, much of the land in Franklin County was in a state of low productivity because of continuous cotton production. Numerous farmers left the county to seek new lands in Texas and other frontier areas of the West. German-Swiss from Northern States and abroad took over these depleted lands and after several years of hardships and adjustments developed an agricultural landscape which has all the aspects of a Corn Belt community. They raised practically no cotton but instead devoted their lands and energy to the production of corn, wheat, alfalfa, crimson clover, potatoes, cattle, sheep, hogs, and poultry. Their barns and houses became as spacious as those common in Iowa, Illinois, and other Corn Belt States. Besides demonstrating that diversified farming is possible and usually profitable on some of the better soils of the South, they were the first farmers in Tennessee to raise crimson clover and alfalfa successfully. Together with other immigrant farmers from Iowa, they were largely responsible for making Franklin County the foremost center in Tennessee in the production of Irish potatoes for the commercial market.

Through the efforts of the German-Swiss, Franklin County also became the foremost center

⁸ Described in Walter M. Kollmorgen, *The German-Swiss in Franklin County, Tennessee: A Study of the Significance of Cultural Considerations in Farming Enterprises* (U. S. Bureau of Agricultural Economics, 1940).

in the South—or the Nation—in the production of crimson clover seed. While this seed is now also produced in other counties of the Southeast, Franklin County has not been displaced from its premier position. Crimson clover is an excellent cover crop in the South. It also provides good pasture all winter long and enriches the soil with nitrogen and humus. When diversified farming becomes more widespread in the South, crimson clover may well become one of the more useful crops.

The German settlement in Cullman County, Alabama, is much larger than the settlement of German-Swiss just described. There are approximately 3,000 persons in the former settlement whereas in the latter there are perhaps 200. The Cullman settlement was established during the closing decades of the nineteenth century on the southern extension of the Appalachian Plateau in north central Alabama.⁸ In this section the plateau is only about 1,000 feet in elevation. Although its soils are somewhat deeper than farther north, they nevertheless are classed among the poorest of the South. During the Civil War, this was still a forested wilderness, but in the following decades Germans from the North and abroad, as well as Georgia hill farmers and some others, occupied the county. The Georgians came to raise cotton and did fairly well with the aid of commercial fertilizer. The Germans came to produce grapes and to carry on diversified farming. Cotton, strawberries, sweetpotatoes, and commercial fertilizer saved them from almost certain disaster. The fact remains, however, that it was these people from outside the Cotton Belt who successfully introduced strawberry and sweetpotato production. For decades now Cullman County has been one of the most important early strawberry centers in the South. The income of the Germans is somewhat higher than that of the adjacent Georgia cotton farmers, and they generally have better farm improvements. Moreover, over 90 percent of them are farm owners whereas among the traditional cotton growers about 55 percent are owners. In spite of a rather remarkable adjustment in an area of poor soils, the settlement cannot be pointed to as highly successful. On the whole, the farm units are too

small to produce adequately for commercial markets. It appears that grazing activities and forest culture should have been combined with the production of traditional farm crops.

A recitation of innovations made by immigrant groups in the South could go on for many more pages. Such a recitation, however, might well create some misconceptions. Immigrants from the North and abroad were by no means all successful, either as isolated settlers or in group settlements; nor were all innovations in Southern agriculture made by transplanted individuals or groups. Concerning the number of failures experienced by immigrants, no information is available. Sites of such failures or near failures are not difficult to find, particularly in such places as the Cumberland Plateau of Tennessee and the uplands of the Arkansas Valley of Arkansas. In some places immigrants or their children still linger on and make a living on or near a subsistence level. Isolation and poor soils reduced some of them to hillbilly types, although those on somewhat better land have developed what local and State officials refer to as exemplary agricultural communities. Also important is the fact that immigrants rarely became share croppers or share renters on cotton or tobacco farms. Such a tenure and class status was utterly unthinkable to them. If no satisfactory adjustment in farming could be worked out, they usually sold out and moved on, unless they remained on small owner-operated farms.

Since space limitations prevent even a cursory examination of all the settlements listed, a number of conclusions and generalizations are presented regarding them collectively. This procedure is necessarily hazardous and may result in some errors in that the generalizations may not all apply fully to every settlement listed. If such errors occur, they may serve a useful function in stimulating further research and writings on these and other settlements.

Available evidence indicates that very few of the immigrant settlements in the South, except those in the subhumid and semiarid belts, were established on good or superior soils. On the other hand, scores of them were established on sandy, crawfish, and barren soils which were not cleared until the close of the nineteenth century or later. Even the soils on which most of the citrus fruits and vegetables are grown in Florida and the soils on which rice is grown in Louisiana

⁸ See Walter M. Kollmorgen, *The German Settlement in Cullman County, Alabama; An Agricultural Island in the Cotton Belt* (U. S. Bureau of Agricultural Economics, 1941).

and Arkansas are of only moderate productivity and call for special management and land use.

In the humid part of the South only two of the settlements listed are found on soils that have or have had considerable inherent fertility. These are the limestone soils of Franklin County, Tennessee, and the alluvial soils in the Red River Valley near Alexandria, Louisiana. The settlements on these soils follow a program of diversified farming in which grains, hay, potatoes, and stock play an important part. It seems probable that many of the other settlements would have introduced a similar program of diversified farming if they had been established on good alluvial or limestone soils. These soils are better adapted to the typical Corn Belt crops than are most of the other soils in the South. However, most of the more productive soils in the South have been under cultivation for considerable time and have therefore not been available for group settlements.

Numerous immigrants failed in the South because they attempted to introduce unmodified ways of Corn Belt farming, which are generally unsuited to Southern conditions. Poor success with familiar grasses and grains excluded stock raising which is a major item in the accustomed farming of these people.

That immigrant farmers on the poorer soils in many instances found it impossible to introduce a successful grass-grain-stock farming program does not mean that similar programs of farming might not have been introduced in recent decades by using new crops and new techniques. Good pastures, including year-around pastures, can now be maintained on many of the poorer soils of the South by planting several of the following: soybeans, cowpeas, Sudan grass, kudzu, crimson clover, lespediza, oats, rye, barley, vetch, black medic, and other crops in various combinations. Periodically a good crop of corn, barley, or oats can be produced on the same lands at small fertilizer cost. Stock farming and dairying are now practical in the South, and as a matter of fact both have been expanding in recent years partly because of the crop-control program. It is interesting to note, however, that in these more recent efforts at diversification, which includes stock farming and the newly popularized legumes, the immigrant farmers do not stand alone. Many of the larger cotton farmers, particularly plantation operators, have also diversified their farm activities.

In most of the immigrant communities a relatively more adequate program of living-at-home

is found than in the Cotton Belt generally. Cows, chickens, and well maintained gardens are the rule among immigrant groups. Exceptions occur mainly in the highly commercialized and specialized poultry, truck, and citrus fruit areas of Florida. In none of the settlements do the operators contend that keeping a good garden interferes with essential farming operations. At least until the recent depression, many cash-crop farmers in the Cotton Belt did not have gardens because their food habits were such that they were satisfied without them. Moreover, as part of their live-at-home program, the immigrant groups have long practiced the canning of food whereas many of the housewives of the traditional farmers first learned the art of canning during recent depression years.

The settlements that have been investigated by the writer show a high degree of farm ownership by farm operators. In a considerable number of the settlements from 80 to 90 percent of the farm operators are owners. The high degree of ownership in the settlements results from several factors. To the recent settlements, the transplanted farmers usually brought sufficient capital to buy the new land. Tenants rarely move to distant parts to undertake types of farming with which they are not familiar. Moreover, tenants usually do not command enough capital to become the object of attention of real-estate firms (some of them fly-by-night concerns with questionable bargains). On the other hand, the high level of farm ownership in many of the settlements of the South, particularly the older settlements, did not result from any special advantage in commanding capital upon arrival but resulted from special programs of farming, diligent work, and thrift. For example, most of the settlers who came to Cullman County, Alabama, to Franklin County, Tennessee, and to Lawrence County, Tennessee, as well as to the settlements in the Arkansas Valley were comparatively poor when they arrived. By the time they had purchased land they were fortunate if they were still out of debt. Severe hardships were common during early days. In some instances from ten to twenty years elapsed before a good cash crop was discovered or a general program of farming was worked out. Nevertheless, where these settlements survived, a relatively high percent of the farm operators maintained farm ownership for themselves and their children.

Group solidarity and churches played their parts in creating stability in the settlements.

Nearly all of the immigrant groups have social and religious values which set them apart from other farmers in the respective areas. These values, like agricultural patterns, are part of the culture of the people, and their farming and living programs must be viewed as an expression of their whole culture. Only in groups could these patterns be long maintained and serious maladjustments avoided. Churches are usually effective in tying these people together and serve not only as religious centers but also as clearing houses for problems of all kinds.

The close integration and cooperation of many of the settlements cannot be disassociated from the successful introduction of new crops and different forms of agricultural improvements. Some of the specialty products are shipped to distant markets, and for such shipments quantity production is usually essential. By cooperation and coordinated effort quantity shipment may be assured. In this respect, communities that are not thoroughly integrated are at a distinct disadvantage.

Extremes in wealth and poverty are not common in these settlements, and there is relatively little social stratification. Ownership of farms is usually attained even if land is rented for a few years. Tenants are rarely croppers but rent for cash. Nor do the tenants constitute an inferior social class. While they are climbing the agricultural ladder, they frequently hold positions of responsibility in churches and other organizations in which owners are predominant.

Agricultural innovations in the South up to this time can be attributed largely to three types of situations, namely the contribution of new ideas and techniques and the introduction of new plants by immigrant settlement groups, crises in established cotton areas by boll weevil infestation, and acreage allotments and war goals.¹⁰ Prior to the recent depression, and particularly prior to the boll weevil infestation, the introduction of new agricultural forms in the South was largely if not mainly associated with immigrant settlers and settlements. Farmers, like others, cling to familiar ways of doing things and in cases of relocation, they may well try to grow crops with which they are familiar. Trial and error have led to the

discovery of numerous profitable cash crops and to the development of a number of distinct type-of-farming areas. In some settlements specialty crops other than cotton or general farming proved profitable. If more immigrant settlements in the South had been directed to better lands, a greater number and more conspicuous examples of diversified farming might long have been developed in the Cotton Belt proper.

The fact that outside capital and immigrant farmers have in many instances been associated with new land developments and new farming ventures in the South also raises the question, What of the future? Will new lands and new crops be financed and developed by outside elements or relocated farmers, or will local farmers rise to these opportunities more generally? There is, of course, much evidence that tradition and custom are less compelling in agriculture today than in former days, and a number of agricultural agencies are spending time and money to further this trend. Long-time cotton growers, both small and large, now speak with some degree of familiarity of legumes, grasses, and crops that they had not heard of fifteen or twenty years ago. Many former cotton farms are getting larger, and non-cotton crops and livestock are becoming more common. While this change may augur well for the South, there remains at least one serious problem, namely, the need for capital.

In the Corn Belt and some other sections of the country, mechanized farms have in recent years become even more mechanized and have also increased in size. In the South, if general diversified farming is to succeed, farms fitted to hoe culture will need to expand, not only moderately but considerably, to compete with the rapidly expanding farms in the North. This means a rather large-scale displacement of small farmers and also bespeaks the investment of large sums of capital, which is generally not in sight in the South. If under these conditions a number of successful diversified forms of stock farming are worked out in various parts of the South in which machine techniques are important, the Corn Belt farmer may again look at brochures describing the Sunny South and opportunities to buy relatively cheap lands. Apparently, many of them would find it less difficult to raise the necessary capital to buy at least several hundred acres of former cotton land than many of the small local operators.

The traditions of small farms and intensive cultivation have served as important obstacles

¹⁰ The relation of the work of the experiment stations, the extension service, and the U. S. Department of Agriculture generally to these situations is too large a subject to be considered within the limits set for this article.—*Editor.*

to the development of adequate farm units in the South. Lands of low productivity are more general in the South than in the North, and up to the present proper uses of these lands by more extensive forms of farming have not been adequately explored. While low productivity can in some instances be overcome by special land management practices and the production of specialty crops, in other instances the proper approach lies in larger holdings and more extensive forms of land use. On these larger units, real farming opportunities exist in developing improved pastures of various kinds and adopting constructive forest culture. Singly or in combination, these uses may bespeak farm units varying from several hundred acres to several sections of land. An investment of ten to twenty thousand dollars in properly selected woodland in the South can become a profitable venture on a sustaining basis in a number of years. Here is a new type of

farming awaiting development, and at this time it is not clear what group will take advantage of this opportunity. However, capital and technical requirements are such that the small farmers in the South will have difficulty in developing farms of this type.

No doubt this article raises more questions than it answers. For the most part it deals with agricultural dynamics and changes, a field which is still largely unexplored. In spite of the voluminous literature on agricultural subjects, we still have little helpful information on the introduction and dispersion of new forms of agriculture and the decline of obsolete forms. Apparently, we will have to know a great deal more about these subjects if we propose to give intelligent guidance to present and future agricultural programs. The agricultural historian, by his training and outlook, should be in a favored position to help find answers to these questions.

TURNER'S THEORY OF SOCIAL EVOLUTION

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The present article is designed to contribute towards the *systematic* and *topical* analysis of Frederick Jackson Turner's work so auspiciously begun on the biographical level.¹ To this end, it deals with ideas and materials which entered into Turner's work and which were not "original" with Turner. Needless to say this approach is not a derogation of Turner, for there would be no advancement in scholarship if everyone started from scratch. In fact, the scholar with a truly creative mind is not satisfied with unearthing and collecting new materials in a squirrel-like fashion; nor does he confine himself to purely speculative thoughts. Rather will a certain set of facts fulfill all of a sudden certain expectations which had been taking

shape slowly and often vaguely in his mind. It is difficult to ascertain what is happening when ideas and facts meet in this way and manner because in most cases neither the idea nor the facts are primary and well defined. All we know is that both are welded together into a new mold, that is, a concrete form of ideal design, and that this is being accomplished during a short and happy interval when the predisposed mind encounters congruent facts. From then on, this ground pattern is used for rendering the amorphous and bewildering mass of knowledge amenable to interpretation and lucid presentation.

The biographical evidence concerning Turner and his work seems to justify and even to call for an analysis along these lines.² We are told that narrating events was never his forte, that finding proximate explanation always was, that he sought a principle of order in the seeming chaos of American development, and that from the outset he was the philosopher who sought meaning in history. Yet, if he did harbor a philosophy of history, it did

¹ See Carl Becker, "Frederick Jackson Turner," in Howard W. Odum, ed., *American Masters of Social Science*, 273-318 (New York, 1927); Fulmer Mood, "The Development of Frederick Jackson Turner as a Historical Thinker," in Colonial Society of Massachusetts, *Transactions*, 34:283-352, and "Turner's Formative Period," in *The Early Writings of Frederick Jackson Turner*, 3-39 (Madison, Wis., 1938). Hereafter, this first reference is cited as Becker, "Turner"; the second as Mood, "Development"; and the last as Mood, "Turner's Formative Period."

² See especially Becker, "Turner," 296, 306; Mood, "Turner's Formative Period," 4-5, "Development," 305-307.

not take the form of an answer but that of a question which he brought to bear upon a limited historical experience—the experience of the American people in its movement across the continent. In it, Turner found a hidden meaning of far larger import than barely two hundred years of American history seemed to warrant. Under philosophical, or rather sociological, interrogation, American history became an example of social evolution, and Turner found the basic character as well as the stages of this evolution clearly revealed in the story of the American West. Thus, the West and the Frontier acquired deep significance, not only because they provided the clue to American history but also, and even more, because the American West and the American Frontier were instructive manifestations of a universal occurrence—namely, of the process of social evolution.

Here, then, emerges the theme of this article. Turner modeled a certain set of demographic and historical facts into an example of social evolution. Neither the material used nor the idea of social evolution and its stages was original with Turner.³ His contribution consisted in bringing both together in a particular and indeed original way, thus achieving a splendid and eminently fruitful interpretation of American (and almost universal) history. Our task, then, is to find out precisely in what manner and for what reasons these two elements of fact and theory were joined together during the incipient period of Turner's life work. This necessitates, first, an inquiry into the nature of the factual materials used, and, second, a closer acquaintance with Turner's early ideas concerning social evolution; third, and most important, we shall try to understand that "flash of insight" which produced the basic concepts of Turner's famous essay on "The Significance of the Frontier in American History" in 1893.⁴

TURNER AND THE CENSUS

The "Official" Frontier: We need not search blindly for the factual cornerstone of Turner's interpretation of American history. Turner himself pointed to his basic set of facts clearly and often, and he did so most insistently when he

³ See especially Mood, "Development," 304-318, on these points.

⁴ Mood, "Turner's Formative Period," 4-5. For a list of several reprintings and a comparison of the several texts of the essay, see *The Early Writings of Frederick Jackson Turner*, 237-238, 275-292 (Madison, Wis., 1938); hereafter cited as "The Early Writings."

quoted at the very beginning of his famous essay the Superintendent of Census who had recently said: "Up to and including 1880 the country had a frontier of settlement, but at present the unsettled area has been so broken into by isolated bodies of settlement that there can hardly be said to be a frontier line. In the discussion of its extent, its westward movement, etc., it can not, therefore, any longer have a place in the census reports."⁵ This quotation was immediately followed by Turner's own exclamation: "This . . . marks the closing of a great historic movement."⁶ Why should Turner accord such profound importance to the simple announcement that the census bureau would not continue a previous discussion? Why should he pay at all so much attention to the census publications, to most people then and now—and to most historians too—rather dull volumes filled with figures, maps, and graphs? For an answer, it seems quite pertinent to inquire more closely into the precise meaning of the Superintendent's statement.

The census report of 1880 contains a series of maps showing the extent of the inhabited area of the United States for every census year since 1790. Furthermore, each map clearly indicates how densely the various parts of the settled total area were populated at the time. This remarkable cartographic achievement was based on calculations designed to measure, and group together, average densities of settlement. The number of people in each county or minor division had been reduced to the square mile, and these quotients had been combined into groups of between 2 and 6, 6 and 18, 18 and 45, and 45 and more inhabitants per square mile. Areas having density quotients of the same group were then laid out on maps with

⁵ U. S. Census Office, 11th Census, 1890, "Distribution of Population according to Density: 1890," *Extra Census Bulletin 2* (Apr. 20, 1891). This publication appeared more than two years before Turner read his essay. The passage is reprinted in *Compendium of the Eleventh Census: 1890*, pt. 1, p. xlvi. Its date of transmittal was Dec. 8, 1892—only half a year before the meeting in Chicago. The full *Report of Population of the United States at the Eleventh Census: 1890*, pt. 1, p. xxxiv (Washington, 1895), reprinted the statement. This volume was transmitted Oct. 22, 1894 and could therefore not have been known to Turner.

⁶ "The Significance of the Frontier . . .," in *The Frontier in American History*, 1 (New York, 1920). Hereafter, this volume of collected essays is cited as *The Frontier*.

the same shade of brown, these shades ranging from light to dark according to the groups. These maps formed the basis of an essay on "The Progress of the Nation: 1790 to 1880" which discussed the changes in total population, its spacial distribution and regional differences for each census interval.⁷ The author of this essay was Francis A. Walker, the superintendent of the censuses of 1870 and 1880, and the editor of the first *Statistical Atlas of the United States* which contained the same type of maps and discussion based on the Census of 1870.⁸

The census maps help, first of all, to visualize how much territory of the United States was inhabited, and how far settlement extended, in each census year; the colored part of each map covers the settled area, and the outside line of color "which limits the average density of two to a square mile, is considered as the limit of settlement—the frontier line of population."⁹ Next, a comparison of the successive maps reveals the progress of settlement and shows clearly that the lines of farthest advance followed certain topographical features of the American landscape. Nor is the usefulness of these maps confined to picturing total settlement and its expansion; they indicate also some of the demographic changes which occurred behind the frontier. Areas over which the frontier had passed filled up, developed denser settlement, and became dotted with towns and finally cities. Consequently, the maps show ribbons of various shades of brown following a certain pattern; they are generally of the darkest hue in the east becoming lighter and lighter farther west till they reach the area of unshaded white, that is, the frontier.

In the "Progress of the Nation" essay Francis A.

⁷ U. S. Census Office, 10th Census, 1880, *Statistics of the Population of the United States at the Tenth Census (June 1, 1880)*, xi-xxxiii (Washington, 1883).

⁸ Francis A. Walker, *Statistical Atlas of the United States, Based on the Results of the Ninth Census 1870 . . .*, plates xvi-xix (1874).

⁹ In the atlas of 1874, the "outside lines of color" are interchangeably called "line of population," "frontier line," "line of continuous settlement," and simply "frontier." At the time of the Census of 1880, Walker had apparently decided to call it the "Frontier Line of Population." For each census since 1790, the area enclosed by this "frontier line," as well as the length of the line itself, was computed by tracing all the ins and outs of this frontier line which seemed to indicate "a distinct change in the settlement of the country for any cause."

Walker pointed out all the obvious inferences to be drawn from these maps, stressing in particular the influences of topography, climate, natural vegetation, and resources upon the tempo and direction of population changes. The crowning piece of Walker's cartographic magic is, however, his fixation of the geographical center of population. The methods of "weighing" the total population, of finding their point of gravitation, and of determining latitude and longitude for this point, were innovations which are still used by the census bureau. Walker himself obtained a most striking result by placing the population centers of each census on the same map. To the surprise of probably every reader—then and now—these centers of population move straight west, and in similar distances, from 1790 to 1890. The impression gained is one of steady and forceful advance by the American population from due east to due west. Here seemed to be definite, objective, and measurable proof for a great movement which characterized an important span of American history.

Turner's Acquaintance with the Census: Turner acknowledged freely and often his indebtedness to the population maps of the census. It suffices to quote from the introduction to the frontier essay which he wrote on the occasion of its republication in the *Yearbook of the National Herbart Society* in 1899: "In the *Report on Population of the United States at the Eleventh Census*, Part I, the student will find a series of maps representing the advance of population at each census period since 1790. By a consideration of these maps in connection with a relief map of the United States . . ., it will become plain that for an adequate comprehension of the course of American history it is necessary to study the process by which the advancing flood of settlement flowed into the successive physiographic areas."¹⁰

The only further question in this connection concerns Turner's knowledge of the maps and the essay on "The Progress of the Nation" at the time when he worked on his paper for the Chicago meeting. The answer is definitely in the affirmative. In his essay, he cited among other sources the "*Compendium of the Eleventh Census*, I, xl," where we read as follows: "In the course of the settlement and development of a country the industries commonly follow one another in a certain order. After the hunter, trapper, and prospector, who are commonly the pioneers, the herdsman fol-

¹⁰ *The Early Writings*, 280. See also *ibid.*, 277.

laws, and for a time the raising of cattle is the leading industry. As settlement becomes less sparse, this is followed by agriculture, which in its turn, as the population becomes more dense, is succeeded by manufactures, and, as a consequence, the aggregation of the people in cities. All stages of this progress are seen in this country."¹¹ A comparison with Turner's own words shows a rather close parallel; and to leave no doubt about his source, Turner continued his own text with these words: "This page is familiar to the student of census statistics." However, the *Compendium* did not contain the series of maps showing the density of population per square mile; these were published two years later in the full census reports. But Turner must have known the density map for 1890, because it was published in advance in the same *Extra Bulletin No. 2* which printed the Superintendent's pronouncement on the closing of the "official" frontier. The density maps up to 1880 were certainly known to Turner also; he may have had access to the census reports themselves; it seems more likely, however, that he was more familiar with the settlement maps in *Scribner's Atlas* which were based on, though not identical with, the census maps.¹² This publication which was in many ways a follower to the *Statistical Atlas* of 1874, is often cited by Turner in his writings.

All this does not yet explain why the statement of the superintendent for the Census of 1890 that the frontier was "officially" closed produced such a deep impression on the young scholar. Before

¹¹ *Compendium of the Eleventh Census: 1890*, pt. 1, p. xl, cited in *The Frontier*, 11.

¹² Fletcher W. Hewes and Henry Gannett, *Scribner's Statistical Atlas of the United States* (New York, 1883). The maps on plates 13 through 17 show changes in territory and settled areas for each census from 1790 to 1880. These maps do not contain the density grades of the census maps, but plate 22 reproduces the density map for 1880 in great detail. In *The Early Writings*, 75-76, the footnote refers to plates 34-37 of *Scribner's Atlas* as the maps Turner had in mind; this is erroneous because these maps show interstate migration and are only very remotely connected with Turner's theme of the frontier. The editor was probably misguided by the reference in Turner's text to the "settled area" as "colored," whereas in *Scribner's Atlas* the census technique was reversed and the unsettled area was stippled. Turner's own mistake is easy to understand when one assumes that he knew both the census report for 1880 and *Scribner's Atlas*.

further pursuing this theme, it may be well to recall with what eager expectation Turner awaited the 1890 census report. In an essay on "Problems in American History," published in the fall of 1892, he had said: "Study the maps in *Scribner's Statistical Atlas* in which the settled area is colored for the various census periods, and you will perceive that the dark portion flows forward like water on an uneven surface; here and there are tongues of settlement pushed out in advance, and corresponding projections of wilderness wedged into the advancing mass. The map for the next census will show gaps filled in, and the process repeated on a new frontier line."¹³ However, *Extra Bulletin No. 2* of the census bureau said bluntly that there never would be a next frontier. Very likely Turner was at first deeply disappointed. But this reaction must have given way eventually to quite another more profound and fruitful one. The very fact that the frontier had become a thing of the past rendered it a proper object for a historian to discover and interpret. A new field of vision into the past opened up precisely because a great historic movement had ended. Here indeed was the starting point for a great historian. At this juncture, Turner's own ideas about history and the historian were to exert their deepest influence, because they would determine how far this "shock of the cerebral processes" would carry him on the road toward a great achievement.¹⁴

TURNER ON "THE SIGNIFICANCE OF HISTORY"

About two years before presenting his frontier paper at Chicago, Turner wrote an essay which included his favorite word "significance" in the title; it is called shortly and provocatively "The Significance of History" and was little known until its republication in "The Early Writings."¹⁵ It sums up Turner's general ideas about history after his return from Johns Hopkins University where he had spent the college year of 1888-89. It is, therefore, not surprising that Turner paid tribute to the then prevailing school of thought at that university which he credited with having "expounded the evolution of political institutions." But Turner already disagreed with the institutional school in vital respects. He pointed with approval to "another and an increasing class of historians

¹³ *The Early Writings*, 75. For comments on the maps referred to by Turner, see note 12 above.

¹⁴ Mood, "Turner's Formative Period," 5.

¹⁵ *The Early Writings*, 43-68.

... who aim to show that property, the distribution of wealth, the social conditions of the people, are the underlying and determining factors to be studied. This school, whose advance guard was led by Roscher... is now going on to rewrite history from the economic point of view." The focal point of modern interest was to be "the fourth estate, the great mass of the people." This stress on economic and social facts marks Turner's principal divergence from the institutionalists, but he was no less critical of the methods used by the Johns Hopkins school. He emphasized that "*Each age writes the history of the past anew with reference to the conditions uppermost in its own time.*"¹⁶ Thus the historian's goal is "the living present"; and since "the significance of events develops with time," the historian should strive "to show the present to itself by revealing its origin from the past." But how will the historian fulfill this task? Will he be able to show the roots of the present in the past by narrating events in their chronological order, "from January to November," as Becker has drastically put it?¹⁷ Criticizing the customary subdivision of European history into ancient, medieval, and modern times, Turner exclaimed: "Strictly speaking, there are no such divisions.... There is another test than that of chronology; namely, stages of growth." The growth, we have to ask, of what? In the answer to this question, Turner was bringing together all the elements of his early philosophy of history. The economic and social forces, the modern interest in the great mass of the people, make *society* the center of historical forces and events. Society develops in *stages* and thus conforms to the true chronology of events. The *significance* of these events develops with time and is, therefore, in the highest stage of self-revelation in the present. The true historian addicted as he is to the *living* present will show the present to itself by revealing its stages of growth. "So it is true in fact," exclaimed Turner, "that in history there are only artificial divisions. Society is an organism, ever growing. History is the self-consciousness of this organism.... There is no break.... There is unity as well as continuity."

If this is the gauntlet thrown down to American students who "go to the 'prim little townships of Sleswick' for illustrations of the law of continuity

¹⁶ *Ibid.*, 52. The italics are Turner's.

¹⁷ Becker, "Turner," 296.

and development,"¹⁸ it is, nevertheless, made wholly of tough German leather. There is the organic society of eternal growth; there is subjective and objective history, ever becoming and revealing itself in time; and there is the crowning masterpiece of development, the historian, in whom the self-revealing history of organic growing society attains self-consciousness. Schelling, Herder, and Hegel raise their speculative heads, and there is ample evidence throughout the essay that Turner indeed was deeply impressed by these and other German historians and philosophers.¹⁹ With all due respect to the great historian Turner, I cannot help feeling that the philosophical ideas expressed in "The Significance of History" are but an example of speculative thought provoked by the reading of difficult German writers and that they were not yet tempered by the fire of living history, that is, of true historical experience.²⁰

It is my considered belief that Turner himself became aware of the shadowy nature of his philosophy when he tried to bring its lofty tenets nearer home. He often alluded to America and its history, but in the whole essay there is no word about American society, its stages of growth, its manifestations of self-consciousness, etc. In one short paragraph only, a "socialistic inquiry"²¹ is attempted, and this inquiry is confined, interestingly enough, to "the problems of socialism brought to our shores by European immigrants." The first part of this discussion reads: "... we meet Europe not only outside our borders but in our very midst.... Every economic change, every political change... in Europe, has sent us groups of colonists who have passed out onto our prairies to form new self-governing communities, or who have entered the life of our great cities. These men have come to us historical products, they have

¹⁸ "The Significance of the Frontier...," in *The Frontier*, 10.

¹⁹ Turner quoted throughout the essay, and with seeming approval, Schelling, Herder, Niebuhr, Ranke, Droysen, and Lorenz, and from the "economic" historians, Roscher, Knies, and Wagner. He said: "In the union of public service and historical study Germany has been pre-eminent."

²⁰ This view is very different from that of Mood, "Turner's Formative Period," 31, who has called this essay a "wise, learned, and stimulating piece" and praised its "eloquence, broad philosophical outlook, and prophetic insight."

²¹ "Socialism" is not used here in any party sense; today we would say "social problems" instead.

"...to us not merely so much bone and sinew, but have brought with them deeply inrooted customs and ideas. They are important factors in the political and economic life of the nation. Our destiny is interwoven with theirs; how shall we understand American history without understanding European history?"

Here, the future advocate of the purely American viewpoint in the history of this continent only offered the immigrant from Europe and his "deeply inrooted customs and ideas" as the clue to American history. And whatever he may have said or thought about the institutionalists, his own concrete ideas about American history were not yet far removed from theirs. Thus, it may not be surprising that Turner's discussion of the immigrant ends on a rather sudden note of dissatisfaction and almost despair. "The story of the peopling of America has not yet been written. We do not understand ourselves." Young Turner, who would strive to reveal the living present to itself, admitted dolefully that the American people do not understand themselves. And why not? Here, for the first time, the true Turner answered: The history of the peopling of America is not yet known. Would he write this history? Where would he find the materials to show the full and unmistakable facts of the peopling of the continent? Indeed, the census reports must have made the deepest of impressions on Turner at that time. They provided the story of the peopling of America in accurate figures and colored maps, tabulated in miles and square miles and explained in terms of his native mountains, rivers, and plains. More strikingly still, this whole process was presented in the state of closing up or fulfilling itself. Here, if anywhere, was the "living present, showing itself to itself by revealing its origin from the past." This is why the official announcement of the closing of the frontier must have produced the flash of insight that Turner had. Given this central and focal point, Turner's pale philosophical ideas would be filled with concrete meaning and furnish the tools for discovering true significance in history.

TURNER'S THEORY OF THE WESTWARD MOVEMENT

Social Evolution: Society, ever growing, was the central theme of all history to the early Turner. American society, "rapidly—I was about to say fearfully—growing" became the all-absorbing

quest of the mature scholar.²² During the critical time when he was meeting with his true calling, Turner was at a loss to comprehend American society as a historical entity, that is, to discern its pattern of economic differentiation and its stages of social growth. Through the census reports, he became familiar with facts and figures showing economic and social design, causation, and results. Indeed, the census materials would suggest to most people only what Walker's "Progress of the Nation" essay had pointed out already. But to Turner they revealed much more, namely "a concrete illustration . . . of the social process" and an answer to "the central question of all Turner's work: How does civilization march . . . from simple to complex forms?"²³ It will then be our task to find out precisely why and how the census materials fitted into Turner's concepts of social evolution and were able, in turn, to substantiate his general ideas on the more limited basis of American experiences.

The "society," delineated in the census reports seems to consist of isolated and then artificially integrated atoms only, that is, of nothing but noses counted by enumerators. But the sheer numbers of inhabitants would none the less acquire social significance, once they are related to a unit of area. What kind of an existence, for example, would "two inhabitants to the square mile" lead? Certain vocations require wide-open spaces; others presuppose denser settlement; and still others are found only in cities. Thus, each degree of density corresponds to a certain type and mode of making a living; there even seems to exist a causal relation, because the denser the settlement, the more complex and "civilized" its life becomes. If one would define social progress and its stages in terms of increasing division of labor (and who did not do so towards the end of the nineteenth century?), then areas of different density of population, as pictured in the census maps, would show these stages of social progress spread out simultaneously on the map of the United States. This visual evidence impressed Turner deeply, because it reversed the customary mental picture of historical processes. "Growth" occurs in time; "stages of growth" follow each other in succession. Ordinarily, an all-embracing unit, like a society, evinces at present one stage only. All the earlier stages are preserved in ruins, memories, and mute records, interpreted by

²² John C. Calhoun quoted by Turner, "The Significance of the Frontier . . .," in *The Frontier*, 2.

²³ Becker, "Turner," 296.

the historian. The past, thus, is dead; only the present is alive. But here, in America, Turner discovered historical stages living in the present side by side. Moreover, these stages followed a clearly recognizable pattern which unfolded itself in the wake of the advancing frontier. This, then, was the true significance of the westward movement: "The United States," said Turner, "lies like a huge page in the history of society. Line by line as we read this continental page from West to East we find the record of social evolution. It begins with the Indian and the hunter; it goes on to tell of the disintegration of savagery by the entrance of the trader, the pathfinder of civilization; we read the annals of the pastoral stage in ranch life; the exploitation of the soil by the raising of un-rotated crops of corn and wheat in sparsely settled farming communities; the intensive culture of the denser farm settlement; and finally the manufacturing organization with city and factory system."²⁴

Thus, American history would show the universal progress of society from primitive to more complex and civilized forms in concrete and objective terms. Were not the census statistics indisputable records, tempered in the most scientific process of fact finding, that is, in the crucible of figures? They were indeed rock-bottom facts, and only he who has never experienced the salutary jump from the lofty heights of speculative philosophy into the realm of hard reality will marvel at the enthusiasm with which the young scholar Turner—only two years after his sojourn at Johns Hopkins—embraced the cold facts and figures of the census reports.

This did not mean, however, that Turner had foregone speculative thought and world-wide vision. Indeed, he at once applied this "process of social evolution" which he had found so clearly enacted in America, to the old continent and mother of colonization, Europe. But he seemed to prefer, as often, to let others speak for him. "Loria," he said, "the Italian economist, has urged the study of colonial life as an aid in understanding

²⁴ "The Significance of the Frontier . . .," in *The Frontier*, 11. The next sentence, "This page is familiar to the student of census statistics," shows how closely the perhaps best formulation of Turner's "stage theory" was associated in his mind with the population statistics of the censuses.

the stages of European development.... 'America,' he says, 'has the key to the historical enigma which Europe has sought for centuries in vain, and the land which has no history reveals luminously the course of universal history.' "²⁵ More than ten years later, Turner formulated even more pointedly the same idea when he said that the American pioneer was compelled "continuously to develop, almost under the actual observation of the present day, those social and industrial stages which, in the Old World, lie remote from the historian and can only be faintly understood by scanty records. The factor of time in American history is insignificant when compared with the factors of space and social evolution."²⁶

These quotations reveal Turner as having hinted at a universal, or at least American and European, application of his theory of social evolution to history. True, he did not attempt to rewrite European history, as he rewrote that of America, but he certainly turned the tables on the institutional school by reversing radically its approach. As every reader of his essays knows, Turner did not deny the influence of Europe and its institutions on America, but he did insist that American history has something to teach which Europe had forgotten because it is lying there buried in the remote past. The wisdom of Goethe—"America, you are faring better, you do not have ruins or castles"—applies even here. American society was born without, and even in defiance of, the blessings of political authorities, inherited customs, civilized manners, and traditional skills. It grew out of the struggle between man and untamed nature and savage foe; it developed its organs in the wilderness where nothing counts but physical strength and cunning. This origin of primitive society on the frontier is all important because it is setting the pattern and pace for all the following stages of social and economic growth. The knowledge of the conditions under which "primitive" society is created will therefore provide the most important clue to American history and European as well.

Pursued to its logical conclusion, all this would seem to mean the abdication of history in favor of sociology or other social sciences. If the true meaning of historical events is found in man's response to a condition, that is, his encounter with

²⁵ *Ibid.*, 11.

²⁶ "Problems in American History (1904)," in *The Significance of Sections in American History*, 6 (New York, 1932).

savage nature, there is no compelling need to delve into the past in order to understand the past or present either. Obviously, there are still places in the world of today where the encounter of man with nature is taking place under primitive conditions, and if there is evolution, its incipient stages and thereby its "law of continuity" can be discerned in the present and in space as well as in the past and in time. History would then be one field among others in which the struggle of mankind with nature can be observed in its manifold manifestations and solutions. Indeed, history would be at a disadvantage in this respect, because the first stage of primitive society is obviously better known to the ethnologist, the geographer, and the anthropologist. In other words, the clue to history may be in the hands of those who prefer the "land without history" to the country with ruins and castles and to whom "the factor of time . . . is insignificant when compared with the factors of space. . . ."

The Frontier: Turner's great discovery was that the origin and incipient law of society could be studied in the life of the American pioneer as it had been enacted under the very eyes of the historian. His theory of social evolution thus came to center in his concept of the frontier. In pursuance of our former remarks, it seems appropriate, to ask how the facts of the census reports fitted in with and in turn molded Turner's ideas about the frontier.

The part played by the census data in this respect is at first less apparent than may be expected. This is largely due to the fact that Turner defined the frontier differently than the census publications had done. He used the same term but broadened it at once by discarding the vaunted frontier "line" altogether. "In the census reports," Turner wrote, "it [the frontier] is treated as the margin of that settlement which has a density of two or more to the square mile. The term is an elastic one, and for our purposes does not need sharp definition. We shall consider the whole frontier belt, including the Indian country and the outer margin of the 'settled area' of the census reports."²⁷ This innocent sounding widening of a "margin" into a "belt" turned the frontier into a broad stretch of untamed wilderness, the scene of fierce fighting between the white man and the redskin, and, above all, the place where the colonist had to forego his

European accomplishments and had to learn and profit from his foes. "In short, at the frontier the environment is at first too strong for the man. He must accept the conditions which it furnishes, or perish, and so he fits himself into the Indian clearings and follows the Indian trails. Little by little he transforms the wilderness, but the outcome is not the old Europe. . . . The fact is, that there is a new product that is American."²⁸

Indeed, the census definition of the frontier as a border case of statistical computation does not seem to have much in common with Turner's highly dramatized version of the frontier and its life. Nevertheless, some of its threads did come from census data and furnished Turner with possibly the strongest though certainly not the most colorful materials for his fabric.

Attention may first be called to the fact that Turner always alluded to the frontiersman in the singular. This may be purely rhetorical language, but is it really too farfetched to suspect that this lonely pioneer in the wilderness is kin to the "inhabitant per square mile" of the census reports? This question may sound rather irreverent when we remember the poetical language with which Turner greeted the pioneer as the "forelover" of the American empire.²⁹ However, we do not inquire here into the historic accomplishments of the frontiersman; we are concerned solely with the more "static" characteristics which seem to qualify Turner's pioneer for his part as prime agent in the incipience of society. In this respect, it seems significant that Turner's picture of the life of the frontier does not emphasize the facts and motives of group life and its problems. True, he praised "the log rolling, the house-raising, the husking bee, the apple paring, and the squatters' associations," but he limited the importance of these "informal combinations" to the role of "supplementing their [the pioneers'] individual activity."³⁰ In other words, social motives, organized efforts, reliance on

²⁷ *Ibid.*, 4.

²⁸ When the frontier essay was reprinted in the National Herbart Society *Yearbook* in 1899, Turner prefaced it with a stanza from Kipling's poem, "The Forelover." See *The Early Writings*, 276. The entire poem was quoted by Turner in his "Pioneer Ideals and the State University (1910)," in *The Frontier*, 270, where he asserted "the poem portrays American traits as well."

²⁹ "Middle Western Pioneer Democracy (1918)," in *The Frontier*, 343.

²⁷ "The Significance of the Frontier . . .," in *The Frontier*, 3.

outside help, and respect for others, are not essential for Turner's concept of the frontier and its people. On the contrary, their absence is emphasized strongly and often: ". . . the pioneer had the ideal of personal development, free from social and governmental constraint. . . . The prizes were for the keenest and the strongest. . . ." This rugged individualism led many pioneers so far that they even defied law and order. "Many of the pioneers," Turner remarked, "subordinated the rights of the nation and posterity to the desire . . . that the individual should advance with as little interference as possible."³¹

Turner's concept of the frontier people as strong-willed individualists preserved intact one of the most essential features of the "inhabitants" of the census reports. In their independence the pioneers are all alike, and no further evidence than their sparsity ("two per square mile") is needed to imagine, with Turner, the kind of existence they were leading. Take, for contrast, the inhabitants of a city; from their number and density of habitation nothing much can be inferred, unless they are subdivided into groups according to income, occupation, wealth, etc. Not so on the frontier; there space and individualism alone made up and determined the structure of society. Everything Turner had to say about this society reflects these two basic constituents. Thus, the frontier knows no classes but is the realm of social and economic equality. How indeed could subordination and class differentiation originate on the frontier if the life of the pioneer was solely determined by the crude necessities of physical survival? The pioneer had acquired his own tools and weapons by force or barter, had built his own house, had taken the land he wanted, and had no intention of asking anybody's permission to hunt or to cut trees. In every respect the pioneer was "free," and he would remain so as long as the space in which he lived and moved stayed relatively empty. This is why Turner insisted on the vital importance of two further "facts" of the frontier, namely the existence of "free land" and of "social mobility."

"The most significant thing about the frontier," exclaimed Turner in the opening passage of his first frontier discussion, "is, that it lies on the hither edge of free land." Still having the frontier "line" in mind, Turner intended simply to say that on the yonder side of the frontier the land was not yet settled. There the Indian and the

buffalo roamed, and the trapper, hunter, and prospector pitched his temporary tent. But after Turner had dismissed the frontier "line" for the frontier "belt," a second meaning of the word "free" became more and more important. The land in that unsettled zone was free to be occupied, tilled, and abandoned, and above all, it was free for all those who sought opportunity to rise to a better life. "The fundamental traits of the man of the interior were due to the free lands of the West. These turned his attention to the great task . . . of advancing his economic and social status. . . . Where everybody could have a farm, almost for taking it, economic equality easily resulted, and this involved political equality."³² Equality of opportunity, however, is not conditioned by the fact of "free" land alone. It presupposes also that the pioneer was not hampered by any social or other ties. This aspect of frontier life led Turner to define western society as "a mobile mass of freely circulating atoms, each seeking its own place and finding play . . . for its own original initiative" and to exclaim, "We cannot lay too much stress upon this point, for it was at the very heart of the whole American movement."³³ Finally, Turner linked up free land, opportunity, and mobility in this paean: "In these new western lands Americans achieved a boldness of conception of the country's destiny and democracy. The ideal of the west was its emphasis upon the worth . . . of the common man, its belief in the right of every man to rise to the full measure of his own nature, under conditions of social mobility."³⁴

One final feature of Turner's frontier concept may again serve to illustrate how well he succeeded in making the census materials serve his ulterior purposes. The density maps had shown the frontier moving across the map, leaving in its wake ever denser settlements the farther it progressed. Even to Turner, the frontier was nothing more than a not too extensive belt in the West, sparsely settled, and certainly not productive of learned or even well-behaved citizens. Why was he, then, perpetually occupied with these insignificant beginnings, and not with the magnificent result of

³² "The Problem of the West (1896)," in *ibid.*, 211-212.

³³ "The West and American Ideals (1914)," in *ibid.*, 306.

³⁴ Frederick Jackson Turner, *Rise of the New West 1819-1829*, 68-69 (New York, 1906).

³¹ "Pioneer Ideals . . .," in *ibid.*, 271-272, 273.

the westward movement, that is, "the lofty buildings and crowded streets" of the cities about which the pioneer had dreamed?³⁵ There was little doubt that frontier conditions affected only a small proportion of the American people in any given year or period. But the frontier had not stayed put; it had pushed farther and farther into the West. In moving on, Turner said, it had imparted to every part of the country its spirit of fierce independence, of wide-open spaces, of practical ingenuity. Viewed from the older parts, the New West—and there had always been a New West—resembled the old giant of Greek mythology who acquired new strength when thrown to the ground. This strength of the frontier life pulsated through the fabric of all American life; it was, in fact, shaping this life into something particular and praiseworthy, namely, the American way of life. In one of the most telling passages of his work, Turner summed it all up: "The West, at bottom, is a form

³⁵ *Ibid.*, 107

of society, rather than an area.... a new environment is suddenly entered, freedom of opportunity is opened, the cake of custom is broken, and new activities, new lines of growth, new institutions and new ideals, are brought into existence. The wilderness disappears, the 'West' proper passes on to a new frontier, and in the former area, a new society has emerged from its contact with the backwoods. Gradually this society loses its primitive conditions... but it bears within it enduring and distinguishing survivals of its frontier experience. Decade after decade, West after West, this rebirth of American society has gone on, has left its traces behind it.... The history of our political institutions, our democracy, is not a history of imitation... it is a history of the evolution and adaptation of organs in response to changed environment, a history of the origin of new political species."³⁶

³⁶ "The Problem of the West," in *The Frontier*, 205-206.

LAND TENURE IN THE AUSTRIAN MONARCHY BEFORE 1848

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The man who tilled the soil in all the provinces of the Austrian Monarchy, except Lombardy, Venetia, Dalmatia, and northern Tyrol, was almost always a peasant who held the land he worked or the rights to its use from the land's proprietor in return for certain fixed dues and services. In these provinces his relation to the landlord was called "hereditary subjection" (*Erbuntertänigkeit*), which meant that he was the subject (*Untertan*), economically and administratively, of his landlord. In many regions and in many respects there was little practical difference between the status of the peasant and that of a serf, although the law insisted that no one in the German-Slav provinces could be a chattel or be bound to the soil,¹ and although the state had instituted reforms and set up protective legislation designed to improve the position of the peasant.

The government had begun to intervene in the

relations between lord and peasant as early as the last quarter of the seventeenth century, and several decrees issued in the succeeding century were aimed at ending the excesses of peasant exploitation, the so-called *Bauernlegen*, of which the lords were guilty. The principal motive of this policy is supposed to have been a fiscal one. The peasants were the chief source of the state's tax revenue, since the demesne lands of the lord were then tax free. If the lords were not restrained in imposing additional burdens on the peasants, or in taking over peasant land, the peasants would be less able to meet the demands of the central government. By the second half of the eighteenth century, it was clear that this legislation had not had the desired effect and that positive measures which went directly to the heart of the relation between lord and peasant were needed.² The problem that faced the government of the Empress Maria Theresa was to regularize this relationship in order

¹ "Slavery or serfdom, or the exercise of power based upon them, will not be permitted in these lands."—*Allgemeines bürgerliches Gesetzbuch für die gesammten deutschen Erbländer der österreichischen Monarchie*, part 1, sec. 16 (Wien, 1811).

² Karl Grünberg, "Die Grundentlastung," Austria, Comité zur Herausgabe der Geschichte..., *Geschichte der österreichischen Land- und Forstwirtschaft und ihrer Industrien, 1848-1898*, 1:6-8 (Wien, 1899).

to replace *Bauernlegen* with *Bauernschutz*, or protection of the peasant by the government. This was achieved in the 1760s and 1770s by setting up a firm norm for lord-peasant relations in all the Hapsburg lands, which was embodied in a legal code—an *Urbarium*—for agriculture in the various provinces. Although there were differences in the provincial codes, their general principles were alike, i.e., for the first time the exact nature of the duties and rights of lord and peasant was defined, and uniformity was established in each region.³

The general purport of the codes was toward strengthening the title of the peasant to his land, improving his legal status, and protecting his land from the encroachments of his seigneur.⁴ Basic principles of land tenure and of legal status in the German, Slav, and Hungarian lands dated from these codes. Confirming the peasant's hereditary possession of his holding, granting rights in the transfer of holdings, fixing a set number of days of forced labor for the lord (*Robot*), hitherto dependent entirely upon the will of the lord, and depriving the lord of much of his judicial power were among the important innovations that were first made in the *urbarial* regulations of the Theresian period. Even the fixing of existing customs in the law represented reform, since, with a written code, the peasant could feel reasonably safe from *Bauernlegen*. To ensure execution of the codes, local offices (*Kreisämter*) of the central government were especially charged with the duty of enforcing them.⁵

The government of Maria Theresa did make a tentative step beyond regularization toward commutation of the *Robot*. It was believed by the

³ Johann Graf Mailáth, *Das ungriechische Urbarial-system oder des Grundherrn und des Bauers Wechselverhältniss in Ungarn*, 5-6 (Pesth and Leipzig, 1838); Emil Kún, *Sozialhistorische Beiträge zur Landarbeiterfrage in Ungarn*, 88 (Jena, 1903); Peter Evan Turnbull, *Austria*, 2:18-22 (London, 1840).

⁴ Grünberg, "Die Grundentlastung," 10; J. Redlich, "Leibeigenschaft und Bauernbefreiung in Oesterreich," *Zeitschrift fuer Sozial- und Wirtschaftsgeschichte*, 3:266 (1895).

⁵ C. F. Kübeck von Kübau, *Tagebücher des Carl Friedrich Freiherrn Kübeck von Kübau*, edited by Max Freiherrn von Kübeck, 1:86 (Wien, 1909); Turnbull, *Austria*, 2:19-21; Ludwig von Mises, "Die Entwicklung des gutsherrlich-bäuerlichen Verhältnisses in Galizien (1772-1848)," in *Wiener Staatswissenschaftliche Studien*, 4(2):71 (Wien, 1902); Kún, *Sozialhistorische Beiträge zur Landarbeiterfrage in Ungarn*, 88.

Austrian statesmen of that day that the prime duty of the government was to increase population in order to achieve maximum state power. The inefficiency of forced labor was regarded as an insurmountable barrier to the increased food production that would be needed to support a greater population. So in 1778 the peasants of the crown estates were freed of their compulsory labor rent in return for fixed payments, and the soil was divided among them. The temperate Maria Theresa did not try to extend this policy beyond her own estates but hoped that her experiment would serve as a yardstick for other land-owners who would follow her example when they saw the beneficial results.⁶

The invasion of the sphere of lord-peasant relations by the government was evidence of the Theresian policy of enlightened despotism. In imposing uniformity, codification, and administrative efficiency, the policy effected aggrandizement of the central power at the expense of provincial and class privilege. Furthermore, a strengthened peasantry meant a strengthened state, for this lowest and numerically most important class was the paramount source of both revenue and recruits.⁷

The contrast between the moderation of Maria Theresa and the rashness of Joseph is perhaps nowhere more clearly seen than in their handling of the agrarian question. Joseph refused to make adjustments to existing forces. Convinced of the reasonableness of his plans and of the inevitability of the triumph of the reasonable, he swept forward to failure. The belief that the Monarchy's strength and well-being depended upon an increasing population was strong in the Emperor, who leaned heavily upon the great cameralist, Joseph von Sonnenfels, for advice. The *Robot* and the other manorial services and dues were inimical to increased food production and so must be ended.⁸ To the intellectual influence of Son-

⁶ Karl Grünberg, *Die Bauernbefreiung und die Auflösung des gutsherrlich-bäuerlichen Verhältnisses in Böhmen, Mähren und Schlesien*, 1:293-294, 306-307 (Leipzig, 1894); Mises, "Die Entwicklung des gutsherrlich-bäuerlichen Verhältnisses," 69-70.

⁷ This system was called the *Raab'sche System* after Hofrat Franz Anton von Raab of the Commerce Commission who worked it out.

⁸ Viktor Bibl, *Die niederösterreichischen Stände im Vorarlberg*, 62 (Wien, 1911).

⁹ Mises, "Die Entwicklung des gutsherrlich-bäuerlichen Verhältnisses," 78; Grünberg, *Bauernbefreiung*,

nenfels was added the teaching of the physiocrats. Joseph felt that land was the sole and imperishable source of wealth and that it alone should be taxed.⁹ Over and above these ideological concepts was his political heritage from his times—the state-making philosophy of enlightened despotism. With more vigor than that shown by his wiser mother, he hastened the processes of centralization, uniformity, and equality in all aspects of the life of his people. The enforced ending of the *Robot*, and, later, the attempted abolition of hereditary subjection, struck at the bases of noble supremacy. The planned levying of the *impot unique* was another blow aimed at hereditary privilege, since it was premised on the equality of all land and landowners.¹⁰ The humanitarianism which was an important factor in Joseph's reforms was not an unmixed sentiment. He recognized the fiscal value of a free landowning peasantry and was convinced of the accuracy of Quesnay's apothegm, *pauvre paysan, pauvre royaume; pauvre royaume, pauvre roi*.¹¹

The first of the major steps toward emancipation was taken with the Patent of September 1, 1781, which severely restricted the judicial powers of the lord.¹² Two months later, on November 1, 1781, a decree was issued which began with the epochal words "From now on the serfdom of the peasant is completely abolished." It was a short law, but it meant that the peasant, until then bound to the soil in a condition of serfdom, now stood at the halfway house to complete personal liberty. The new law, while making his condition one of hereditary subjection (*Erbuntertänigkeit*), allowed him a large measure of freedom of movement, gave him freedom of choice of occupation and marriage, and ended the compulsory domestic and field service of peasant children (*Zwangsgesindeservice*).¹³ In the succeeding years, further decrees indicated the course Joseph was following. They culminated in the Patent of February 10, 1789, which made obligatory the commutation of

the dues and services of all peasants who paid a land tax of at least two florins to the state. They were to pay 17-7/9 percent of their gross income as indemnity to their erstwhile lord. The law further provided that a tax of 12-2/9 percent was to be levied on the gross income of all land.¹⁴ The decree was intended as the capstone of the emancipation movement. Actually it contained loopholes and weaknesses attributable to the haste with which the reform had been pursued. These faults never were corrected, because the movement which had centered in the person of the Emperor came to its end at his death.¹⁵

Four months after this last decree went into effect on November 1, 1789, Joseph died, leaving behind an empire in confusion. War with Turkey had broken out and was going badly. The provinces were torn with discontent and disturbances, since the privileged classes realized that their predominance would be ended if the centralizing reforms of Joseph were carried through.¹⁶ Faced with the alternative of the dissolution of his state, the Emperor had been compelled to yield partially to the demands of the opposition. Only a few weeks before his death, he revoked all his reforms in Hungary, save the abolition of serfdom. Upon his death, the last barrier fell, and a flood of reaction swept the land. His successor, Leopold II, gave in to the great pressure brought upon him by the estates of the various provinces, repealed the decree of February 1, 1789 in the German-Slav lands, and provided that commutation was to be made voluntarily.¹⁷

When Francis ascended the throne in 1792, the Josephine legislation that had protected the peasant was still, in large measure, officially in force, but the Josephine spirit had disappeared, hurried on into limbo by the events of the French Revolution that were sending premonitory shudders through the Austrian ruling class. In the highest councils of the government, there were those who

⁹ *Vollständige Sammlung*, 9:97-111.

¹⁰ G. F. Knapp, "Die Bauernbefreiung in Österreich und Preussen," *Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft im Deutschen Reich*, 18(2):87 (Leipzig, 1894); Robert Endres, *Handbuch der österreichischen Staats- und Wirtschaftsgeschichte*, 107n. (Wien, 1922).

¹¹ Grünberg, *Bauernbefreiung*, 1:315.

¹² *Ibid.*, 315, 320, 335-336.

¹³ *Ibid.*, 320-321.

¹⁴ *Vollständige Sammlung*, 1:244-252.

¹⁵ *Ibid.*, 423-424. This law was not proclaimed in Galicia until Apr. 5, 1782. Grünberg, "Grundentlastung," 17n.

¹⁶ Grünberg, *Bauernbefreiung*, 1:343-344.

¹⁷ Carl Grünberg, "Die Bauernbefreiung in Österreich-Ungarn," J. Conrad, L. Elster, *et al.*, eds., *Handwörterbuch der Staatswissenschaften*, 2:570 (Jena, 1909); Robert Joseph Kerner, *Bohemia in the Eighteenth Century*, 284 (New York, 1932).

feared that any lightening of the burden of the peasant would awaken within him dangerous thoughts of freedom.¹⁸ These men, in contrast to the cameralists of Maria Theresa and Joseph's day, looked upon the *Robot* as a good school for work and for obedient humility, and worried lest the state get from among its emancipated peasants lazy idle subjects who would be a danger to it.¹⁹

The victory of the reaction was completed with the Patent of September 1, 1798.²⁰ This law allowed voluntary commutation to continue but so enmeshed its procedure with formalities and conditioning factors that the permission meant virtually nothing. Outright purchase of his holding by the peasant was permitted. The purchase price was set by law at a capitalized value of the holding's annual income, but very few peasants were able to avail themselves of this because they lacked the cash. So ended the era of agrarian reform, not to be revived for fifty years, during which time Austria sank from her position in the forefront of Europe's progressive agrarian nations to the very rear rank.²¹ Her rulers, who saw revolution in every change, identified agrarian reform with the dreaded revolutionary liberal ideas that were being sown throughout Europe.²²

Still, the governments of Francis and of Ferdinand (1835-1848) made no attempt to restore the peasant to his status of the pre-Theresian era. *Bauernlegen* was, legally, a thing of the past. The land of the peasant was protected against the seigneur who might want to take it from him; the peasant had been accorded recognition as a legal individual; and the judicial powers of the lord had been curtailed. Clearly, the government was still pursuing the policy of *Bauernschutz*, even if it did not seek to improve the existing status of the peasant.²³

¹⁸ Alfred Stern, *Geschichte Europas seit den Verträgen von 1815 bis zum Frankfurter Frieden von 1871*, 1:270 (Stuttgart und Berlin, 1894-1924); Ignaz Beidtel, *Geschichte der österreichischen Staatsverwaltung, 1740-1848*, 2:381 (Innsbruck, 1898).

¹⁹ Bibl, *Die niederösterreichischen Stände im Vormärz*, 71.

²⁰ Seiner k.k. Majestät Franz der Zweyten politische Gesetze und Verordnungen . . ., Sept. 1, 1798.

²¹ Grünberg, *Bauernbefreiung*, 1:356-357, 367-368; Mises, "Die Entwicklung des gutsherrlich-bäuerlichen Verhältnisses," 88.

²² Bibl, *Die niederösterreichischen Stände im Vormärz*, 70.

²³ Grünberg, *Bauernbefreiung*, 1:361-363.

In the German-Slav provinces, with the exception of Tyrol and Dalmatia, land was held in two ways—actual ownership and ownership of the right to use. Where one individual held land both ways, his property was called a *dominical* estate, which meant that certain important social and economic privileges went with it, and that the property was duly entered in the land book of the estates of the province in which it lay.²⁴ If parts, or all, of a *dominical* estate were let out to peasants to be cultivated, it was called a *Herrschaft*, i.e., a manorial estate.²⁵ Certain peasants had a hereditary right to use specific pieces of land on a *Herrschaft*. Their holdings were called *rustical* and carried with them hereditary obligations and subjection to the *Grundherr*.²⁶

Until the last decades of the eighteenth century, only nobles and the Church had held the powers of *Grundherr* over the peasantry, because of restrictions forbidding the ownership of estates by members of other classes. The reforms of Joseph II, however, allowed any Austrian to own land in the German and Slav provinces, so ending the monopoly of the first two estates as *Grundherrn*.²⁷ The wave of speculation and the quick winning of wealth attending the inflation which shook Austria in the era of the French Revolution and Napoleon gave substance to this new prerogative of commoners. Members of the bourgeoisie who prospered in these years, recognizing land ownership as the road to respectability and prestige and anxious to put their dangerously fluctuating capital into something solid, purchased estates.²⁸ Moreover, land speculation proved profitable, since there was a steady rising cash value on land as money depreciated in the first years of the nineteenth century and as the demand for estates

²⁴ Johann Ludwig Barth-Barthenheim, *Das politische Verhältniss der verschiedenen Gattungen von Obrigkeitsherrn zum Bauernstande im Erzherzogthume Österreich unter der Enns*, 1:57-58, 62 (Wien, 1819).

²⁵ Franz Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:114-115 (Wien, 1808).

²⁶ Barth-Barthenheim, *Das politische Verhältniss*, 1:121-126.

²⁷ Karl Grünberg, *Studien zur österreichischen Agrargeschichte*, 112-113 (Leipzig, 1901).

²⁸ Marcel de Serres, *Voyage en Autriche, ou, essai statistique et géographique sur cet empire*, 1:436 (Paris, 1814); Anton Springer, *Geschichte Oesterreichs seit dem Wiener Frieden 1809*, 1:164-165 (Leipzig, 1863).

increased.²⁹ A remarkable turnover of property resulted. For example, in sixty-five instances of estate transfers twenty-seven owners held their properties for less than five years, while one estate in Lower Austria changed hands fifteen times in twenty-seven years, twelve of its erstwhile owners being of the middle class.³⁰ Probably not a great number of estates, however, were transferred from noble to bourgeois hands. The same economic factors that made the middle class crave landed property would have made the noble owners refuse to part with it. The enormous increase in the price of agricultural products during the period of inflation enabled the nobility to achieve a state of prosperity in which they could afford to turn down the lucrative offers of bourgeois would-be purchasers.³¹ Yet there was a sufficient shift in ownership to cause alarm over the fate of the nobility, whose privileged status was based on the possession of land.³² The return to more normal conditions after 1815 did not put an end to this march to the land of the wealthy bourgeois. Whoever wanted to sell a *Herrschaft* was reported to have had no trouble in finding a buyer among the bankers and business men of the cities.³³

Still, the legal barriers sufficed to defeat the threat, if actually there was one, to noble domination of land ownership. In Bohemia and Moravia the laws passed during the first years of the new century against bourgeois ownership of estates had been effective.³⁴ In other provinces there were apparently a greater number of transfers,³⁵ but in all of them there was a legal barrier, which, when present, was unsurmountable. This was the entailing of estates which rendered inalienable much of the land. The founder of many a noble family had carefully preserved for posterity the

²⁹ One estate sold for 9,255 florins in 1769, 29,000 florins in 1801, 40,000 florins in 1805, and 16,600 florins in 1842.—Friedrich Engel-Janosi, "Über die Entwicklung der sozialen und staatswirtschaftlichen Verhältnisse in deutschen Österreich 1815-1848," *Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte*, 17:101n. (1924).

³⁰ *Ibid.*, 101.

³¹ Grünberg, *Studien*, 140, 144.

³² Cf. Springer, *Geschichte Österreichs*, 1:165.

³³ A. Tebeldi [Ignaz Beidtel], *Die Geldangelegenheiten Österreichs*, 176 (Leipzig, 1847).

³⁴ Ernst Violand, *Die sociale Geschichte der Revolution in Österreich*, 28 (Leipzig, 1850); Grünberg, *Studien*, 172.

³⁵ Tebeldi, *Die Geldangelegenheiten Österreichs*, 201.

land he had gained and the dignity he had won for his family's name by entailing his estate. The possessor of an entailed estate had only a life interest in it. He could borrow up to one-third of its value and was obligated to repay 5 percent annually if he did incur debt. The new heir could create new debt only as the old one was paid off, so that two-thirds of the property was always debt free. If there were no heirs, or if all possible heirs agreed, the entail could be extinguished and the now alienable property became the outright possession of its occupant.³⁶

The owner of a *Herrschaft*, whether noble or bourgeois, was not merely a landlord with a private economic function. He had an equally important public function as the representative of the government to the peasants who lived on his estate. He, or more exactly the agents he employed, had to announce and enforce the laws of the state, police his lands, collect state taxes, supervise the trades and industries carried on by his peasants, maintain a court of first instance, act as judge, and punish offenders.³⁷ The extent of this political-juridical power of lord over peasant, called *Patri-monialgerichtsbarkeit*, differed from province to province. In Bohemia and Moravia the lord's court could punish less serious offenses to the extent of three days' imprisonment or fifteen stripes. Crimes demanding more serious penalties had to be tried in the Imperial courts.³⁸ The same system was set up in Galicia, but the understaffed and inefficient Imperial administrative establishment in that land was unable to fulfill its judicial duties out in the country, so that almost the entire burden of government was thrown into the hands of the great landowners, or of their often ill-qualified agents.³⁹ In the German provinces the lord of the manor had virtually no judicial power, his court being little more than a formality that was gone through before the case was heard in the governmental court.⁴⁰ Civil suits in which the peasant had a grievance against his lord were, in most of the provinces, outside the latter's juris-

³⁶ *Allgemeines bürgerliches Gesetzbuch*, part 2, sec. 618-645.

³⁷ Tebeldi, *Die Geldangelegenheiten Österreichs*, 201-202; Grünberg, *Studien*, 148; Violand, *Die sociale Geschichte der Revolution in Österreich*, 32.

³⁸ Turnbull, *Austria*, 2:46.

³⁹ Mises, "Die Entwicklung des gutsherrlich-bäuerlichen Verhältnisses," 93-96.

⁴⁰ Turnbull, *Austria*, 53-55.

dition, but all the advantages lay with him. The bias of the official who first heard the complaint often settled the case in short order in the lord's favor, or the complexities of the legal procedure provided by law drew it out over many years at much expense.⁴¹

In the Salzburg district and the Innviertel of Upper Austria, the Villach circle of Carinthia, Carniola, the Littoral, and the Duchy of Cracow (annexed by Austria in 1846), all of which had been parts of the Napoleonic Empire, the patrimonial jurisdiction of the lord had been abolished. When these lands were regained or annexed by the Hapsburgs, this power of the landlords was not reintroduced but was either immediately or gradually replaced by crown courts.⁴²

The land occupied by the peasants on a *Herrschaft* in the German-Slav provinces was divided into units called *Lehn*. These *Lehn* were either full size or were split into portions down to a quarter *Lehn*, the services and dues required of their occupants being gauged according to the share of the *Lehn* held by them. The size of the *Lehn*, however, varied even on the same estate. One *Ganzbauer*, as the occupant of a full *Lehn* was called, might have 25 yokes in his holding while his neighbor had 50, yet the services and dues required of both were the same.⁴³ Usually the peasant had less than a full *Lehn*. Of the 133,048 peasant holdings in Lower Austria only 20,442 were full *Lehn* of from 35 to 126 acres, 27,119 were half-*Lehn*, 14 to 27 acres, 23,356 were quarter-*Lehn* of 7 to 14 acres; and 62,131 still smaller holdings were occupied by cotters. In Bohemia, Moravia, and Galicia, more than three-fourths of all peasant holdings were quarter-*Lehn*.⁴⁴ In Styria 11,302 peasants had full *Lehn*, 21,080 had half-size ones, 25,725 had quarter-*Lehn*, and 91,273 were cotters.⁴⁵

The rights of the peasant occupant varied from

⁴¹ Hans Kudlich, *Rückblicke und Erinnerungen*, 1:53 (Wien, Pest, Leipzig, 1873), quoting an Austrian landowner who had six villages, speaking in the Austrian Reichstag; Kübeck, *Tagebücher*, 1:88; Violand, *Die sociale Geschichte der Revolution in Oesterreich*, 33-34.

⁴² Grünberg, "Grundentlastung," 5; Heinrich Friedjung, *Oesterreich von 1848 bis 1860*, 1:311-312 (Stuttgart, Berlin, 1908).

⁴³ Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:115.

⁴⁴ Tebeldi, *Die Geldangelegenheiten Oesterreichs*, 200-201.

⁴⁵ F. X. Hlubek, ed., *Ein treues Bild des Herzogthumes Steiermark*, 106 (Graz, 1860).

province to province. In all of them, however, providing he performed the required services and rendered his dues, the *Untertan* enjoyed lifelong use. He could be removed from his land only for certain definite offenses, such as the failure to pay his dues and services for three years despite warnings, letting his land go untilled or become desolate for three years, after being warned, willfully running up a debt of more than two-thirds of the value of his holding, or stirring up unrest. When a peasant was charged with any such offense the officials of the district investigated and decided upon his guilt.⁴⁶ The peasant could leave his holding only if he had the permission of his lord and got another peasant who was acceptable to the *Grundherr* to take his place. If the peasant moved from one military conscription district to another he had also to get the permission of officials. Furthermore, if he moved out of the German-Slav lands into Hungary or Transylvania, he had to pay a certain percentage of the value of all his property to his lord. If he moved to some foreign land where there was a like duty on emigrants, he also had to pay this *Abfahrtsgeld*, or departure tax.⁴⁷ If he wanted to leave the *Herrschaft* to work or to study he had to get permission from his lord. This, when given, was usually only for one year, after which it had to be renewed.⁴⁸

The peasant was obligated to bequeath his land intact to his heir who had to pay off other legatees in money. The law forbade the dividing up of holdings in order to avoid further parcelling of the land.⁴⁹ The peasant could name his own heir, who had to be accepted by the lord unless he could prove to the satisfaction of the district officials that the designated heir was unfit. If no heir was named, the eldest son took over the holding. If there were no direct descendants, the next of kin could sell the land or turn it over to one of the relatives. If the heir was still a child, the widow

⁴⁶ *Ibid.*, 115; Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:117.

⁴⁷ Anton Engelmayr, *Versuch zu einer systematischen Darstellung der im Lande ob der Enns im Unterthansfache bestehenden Vorschriften*, 49-50 (Linz, 1824); Barth-Barthenheim, *Das politische Verhältniss*, 1:175-176, 291.

⁴⁸ Kübeck, *Tagebücher*, 1:238.

⁴⁹ Franz des Ersten politische Gesetze und Verordnungen, Sept. 29, 1803, Aug. 20, 1818; F. W. von Reden, *Der Boden und seine Benutzung im Kaiserstaate Oesterreich*, 112 (Wien, 1857).

could operate the holding or lease it until the heir came of age.⁵⁰ The new occupant of the holding paid a small fee to the lord and was given a certificate by the latter attesting his right to the land. In the Archduchy of Austria and certain other provinces a relief, called *Freigeld* or *Mortuarium*, of 5 percent of the value of the land was demanded of the heir. A similar payment, called the *Laudemium*, was made upon any change in ownership other than through inheritance.⁵¹

The principal service which the peasant rendered in return for the use of the land was work on the demesne of the lord. This was called the *Robot* or *Frohndienst*. The number of days in the year in which the *Robot* was required was set by Imperial law for each province. This number varied considerably between provinces, being as low as 14 days a year for the *Ganzbauer* of Upper Austria, and as high as 156 days for a peasant of the same status in Galicia and Styria. Generally, the peasant holding a *Lehn* was required to do 104 days *Robot* annually, using his own animals and implements, while a proportionately smaller amount was required of the occupants of lesser holdings.⁵² Thus, in Lower Austria, the *Ganzbauer* had to do 104 days with four horses or oxen (*Zugrobot*), the man with half a *Lehn* did the same number of days but with a single team, while the holder of a quarter-*Lehn* did 104 days of *Handrobot*, as *Robot* without animals was called. The cotter did 52 days of *Handrobot* if he had more than a yoke of land and 26 if he held less than this amount. The landless laborer also had to do *Handrobot*, being held to 12 days annually.⁵³ A limit was set upon the number of days each week which the individual could work.⁵⁴ The peasant did not

have to perform his *Robot* personally, but could let his children do it, or could hire a substitute.⁵⁵

The *Zehent*, a payment in kind, was the most important of the dues owed the lord by the peasant. Despite its name this due was not necessarily a tenth part of the total product of the peasant's land, the proportion it represented being set in the agreement between lord and peasant. The *Zehent* was not demanded everywhere, there being large areas, as in Bohemia and Moravia, where it was unknown. In still other places it had been commuted into a fixed money or produce payment. In the German provinces the *Zehent* went with the land, regardless of the rank of the occupant. A noble who rented an estate had to pay the share of the yield that was called for in the contract.⁵⁶ In these lands and in Galicia the *Zehent* was usually about 6 percent of the net product.⁵⁷

There was a multitude of other and lesser dues and services which the peasant was compelled to render periodically; these varied from region to region. Some idea of their large number is realized by the fact that in 1848 an enumeration demanded in the province of Carinthia listed 181 dues and services. Of this total, 71 were money dues, 93 were payments in kind, and 17 were labor services. In Moravia there were 246 different money dues alone.⁵⁸ Hunting and fishing rights belonged solely to the lord. The peasant was forbidden to make spirituous drinks but had to buy them from his lord or from the person to whom the lord had given or rented this right.⁵⁹

Aside from his obligations to the *Grundherr* the peasant was held responsible to the state for certain services. He had to labor on public works, especially on road building and maintenance, in the region in which he lived. He had to allow soldiers to be billeted on him. He had to supply horses and a conveyance for a certain distance to persons having a government order demanding this service (called the *Vorspann*). Finally, he had to pay taxes to the central government and locally

⁵⁰ Grünberg, *Bauernbefreiung*, 1:365.

⁵¹ *Allgemeines bürgerliches Gesetzbuch*, part 2, sec. 1142; Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:118; Hlubek, *Ein treues Bild*, 115.

⁵² Engelmayr, *Versuch zu einer systematischen Darstellung der im Lande ob der Enns im Unterthansfache bestehenden Vorschriften*, 9-12; Barth-Barthenheim, *Das politische Verhältniss*, 1:344-345; Hlubek, *Ein treues Bild*, 114; *British and Foreign Review*, 14:265 (1843).

⁵³ Barth-Barthenheim, *Das politische Verhältniss*, 1:320-330.

⁵⁴ *Ibid.*, 1:338-343; Hlubek, *Ein treues Bild*, 114; Turnbull, *Austria*, 2:45; *British and Foreign Review*, 14:265 (1843).

⁵⁵ Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:131.

⁵⁶ *Ibid.*, 1:127-128; Engelmayr, *Versuch zu einer systematischen Darstellung der im Lande ob der Enns im Unterthansfache bestehende Vorschriften*, 92-97; Barth-Barthenheim, *Das politische Verhältniss*, 2:80-81.

⁵⁷ Tebeldi, *Die Geldangelegenheiten Österreichs*, 203.

⁵⁸ W. Schiff, *Österreichs Agrarpolitik seit der Grundentlastung*, 1:16 (Tübingen, 1898).

⁵⁹ Tebeldi, *Die Geldangelegenheiten Österreichs*, 203; Turnbull, *Austria*, 2:49.

for the maintenance of necessary community services.⁶⁰

The enormous contribution in labor and goods made by the peasantry to their landlords was revealed through indemnification operations after emancipation. In the German-Slav provinces, with the exception of Dalmatia and Bukowina (the easternmost part of Galicia), 2,625,512 peasants had annually performed 29,442,387 days of *Zugrobot* and 38,587,940 days of *Handrobot* for 54,267 landlords. The *Zehent* they had paid each year was valued at 4,067,495 florins. The amount of dues in kind to which the peasants were held each year was 3,677,877 bushels of grain, while the annual money dues amounted to 5,850,916 florins.⁶¹

Besides the arable which the peasant held from his lord he had certain legally defined privileges in the common pasture and in the forest. These privileges were not connected with a right of ownership, for common and forest were both the sole property of the lord. The only basis for the peasant's claim was the right of servitude, that is, the right to use for his own advantage the property of another. Through this right he could drive his cattle into the lord's pasture or fill his need for firewood and timber and gather straw in the lord's forests.⁶²

In 1768, Empress Maria Theresa, hoping to increase the arable, had issued a law ordering all common pastures to be divided between their users and their proprietors. The owner of the common was to keep one-half for himself, while the remaining half was to be split up among the peasant users. Punitive measures against those who did not obey the law and a time limit of one year for its fulfillment were included in the decree, but it had little effect. On at least six occasions in the years following, the order was repeated, until, finally, in

⁶⁰ Barth-Barthenheim, *Das politische Verhältniss*, 1:59-61; *British and Foreign Review*, 14:265 (1843); Kudlich, *Rückblicke und Erinnerungen*, 1:49, 58-64; Tebeldi, *Die Geldangelegenheiten Österreichs*, 203, 217.

⁶¹ Schiff, *Agrarpolitik*, 1:20-21. Other dues for which no indemnity was provided were not included in these figures.

⁶² Walter Schiff, "Die Regulierung und Ablösung der Wald- und Weide-Servituten," Austria, Comité zur Herausgabe der Geschichte . . ., *Geschichte der österreichischen Land- und Forstwirtschaft und ihrer Industrien*, 1848-1898, 1:83; Heinrich Strzelecki, "Die Fortschritte der Forstwirtschaft Galiziens in den letzten fünfzig Jahren und die Ablösung der Servituten," *ibid.*, *Supplementband*, 231 (Wien, 1901).

1808 the government gave up and contented itself with recommending, and not requiring, common division. Only in Moravia does there appear to have been any large-scale observance of these decrees, and even where they were obeyed the usual practice was for the peasants to throw their shares together and still use it as a common.⁶³

A type of tenure similar in many respects to that of the German-Slav lands was found in Hungary and Transylvania. Here, only the Crown, the Church, and the nobles could own land. To ensure the continued possession by the family of its lands, qualifications bordering on the fantastic were put on the alienation of property. Before an estate could be sold to a stranger, it had to be offered at the selling price to all neighbors and all kinsmen, no matter how distant the degree of relationship might be. Only if the neighbors and relatives failed to buy it could a stranger purchase the estate. If the land was not first offered to neighbors and kinsmen, they and their descendants had the right to force the purchaser to sell them the land at the original sale price, plus an additional sum for any improvements made in the interim. Finally, even if the kinsmen were offered the opportunity to purchase and refused, after a period of thirty years any member of the family had the right to force the resale of the property to himself, at the original price plus payments for improvements.⁶⁴ All landed properties were donations, or fiefs, of either the Crown, the Palatine (the viceroy of Hungary), or of certain prelates who had the power to enfeoff, and were returned to the donator at the extinction of the family.⁶⁵

Official statistics of the extent of the holdings of individual Hungarian landowners before 1848 are lacking, but according to descriptions 605 families, a handful of prelates, and the Church owned almost 60 percent (51,881 square miles) of Hungary's 87,956 square miles. Each of the noble families had lands totalling over 11 square miles in area, and 41 of them owned an average of 175 square miles each. Prince Paul Esterhazy,

⁶³ Carl Peyer, *Die Regelung der Grundeigentums-Verhältnisse*, 1-3 (Wien, 1877); Schiff, *Agrarpolitik*, 1:245-247.

⁶⁴ A. de Marmont, *Voyage du Maréchal duc de Raguse . . .*, 1:390 (Paris, 1837); Michael J. Quin, *A Steam Voyage down the Danube . . .*, 85 (New York, 1836); Richard Bright, *Travels from Vienna through Lower Hungary*, 110-111 (Edinburgh, 1818).

⁶⁵ Marmont, *Voyage du Maréchal duc de Raguse . . .*, 1:389.

alone, was lord of 29 estates that covered 14,874 square miles. Prince Batthanyi owned 7 estates, Baron Sina 19, Count Karolyi 19, and Count Széchenyi 18. The total area covered by the properties of these four magnates was 8,502 square miles. These four men and Esterhazy between them owned more than a fourth of Hungary. Besides these five greatest landholders 600 families owned a total of 7,281 square miles. The land held under the "dead hand" of the Church amounted to 21,245 square miles. In this tremendous area a few prelates were the lords of 12,742 square miles, with the remainder held by other Church functionaries or religious communities.⁶⁶

The Hungarian noble exercised greater judicial power over his peasants than did any other land-owner of the Monarchy. The individual lord or his agent could try both civil and criminal cases of a sort that in other provinces would have gone before a royal court. He sat as judge in suits brought by his peasants in which he was the defendant. If the lord was willing, or if the offense was so serious that the law did not allow the culprit to be tried in the manor court, the peasant went before the county (*comitat*) court, and appeal could be carried to higher tribunals. However, all of these courts were made up of, or controlled by, noblemen. The royal government was reached only when the court imposed the death penalty which had to be approved by the Emperor before it could be carried out. A small number of Hungarian magnates had even the right to execute malefactors without the consent of the Crown.⁶⁷

The land held by the peasantry was divided into portions called sessions which were often divided into smaller parts. The size of the session varied from *comitat* to *comitat* but was fixed within the individual *comitat*.⁶⁸ There were 1,426,579 peas-

ant holdings in Hungary, of which 226,000 were full and half sessions, 417,215 quarter sessions, and 783,364 smaller pieces of land held by cotters.⁶⁹ The peasant who occupied a session, or part of one, was entitled as a usufructuary only to the yield brought forth from the land by his own industry. He had no rights of ownership and his tenure was for a limited, although undetermined, period. Unlike the peasant of the German-Slav lands he had no rights in the disposition of the land he tilled, but it was customary for son to succeed father. The lord could dispossess the peasant for certain reasons defined in the laws governing lord-peasant relations.⁷⁰ Only after legislation passed in 1836 could the peasant leave the land of his own volition, and he was still required to give several months' notice and to get the permission of his lord and of the local government official. If the lord refused permission, the peasant could leave if the official gave consent.⁷¹ The reforms of 1836 also allowed the peasant, if his lord was willing, to sell or exchange his right as usufructuary.⁷²

The individual peasant had certain privileges as a member of his community. The seigneur had to provide adequate pasture for the cattle of the community if the nature of the terrain permitted it.⁷³ He had to allow the peasants to gather for firewood fallen or dead timber in his forests; and, if the peasants' needs were not met thereby, the lord had to supply them with cut wood. Lumber for building purposes could be taken without charge only from stands that were within the boundaries of the village. Under certain conditions the forest could be used for pasture.⁷⁴

In return for the right to live on the land of the lord, the peasant had to render certain dues and services. As in the German-Slav lands, the size of the peasant's holding determined the obligation required of him. The holder of a full session had to do 104 days of *Handrobot* or 52 days of *Zugrobot* die Zwergwirtschaft und die Auswanderung (1842)," *Friedrich List, Schriften, Reden, Briefe*, 5:512 (Berlin, 1928); Bright, *Travels from Vienna through Lower Hungary*, 112.

⁶⁶ Alfred Hirsch, *Ungarns Grundbesitzverhältnisse: Agrarstatistische Untersuchungen*, 1-2, 13-14 (Halle a. S., 1893); Georg H. Tornyay-Schosberger von Tornya, *Die Bodenreform und ihre Wirkung auf die Entwicklung der ungarischen Landwirtschaft*, 9 (Leipzig, 1926).

⁶⁷ Mailáth, *Das ungarische Urbarialsystem oder des Grundkerns und des Bauers Wechselverhältniss in Ungern*, 50-51, 63-66; Samuel Sugenheim, *Geschichte der Aufhebung der Leibeigenschaft und Hörigkeit in Europa bis um die Mitte des Neunzehnten Jahrhunderts*, 477 (St. Petersburg, 1861).

⁶⁸ Mailáth, *Das ungarische Urbarialsystem oder des Grundherrn und des Bauers Wechselverhältniss in Ungern*, 90-104; Friedrich List, "Die Ackerverfassung,

⁶⁹ Tebeldi, *Die Geldangelegenheiten Österreichs*, 200.

⁷⁰ Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:120-121.

⁷¹ Mailáth, *Das ungarische Urbarialsystem oder des Grundherrn und des Bauers Wechselverhältniss in Ungern*, 83.

⁷² *Ibid.*, 85-86.

⁷³ *Ibid.*, 17, 22.

⁷⁴ *Ibid.*, 23-25.

each year. Peasants with fractions of sessions did proportionately less, while the cotter did 18 and the landless laborer 12 days of *Handrobot* annually.⁷⁵

Actually, the lord often demanded many more *Robot* days than were legally allowed. The peasant was unlikely to obtain legal relief, since the first court to which he had to go if he wanted to complain was that of his lord. Another method used to get additional labor was for the manorial court to punish lawbreakers by giving them extra *Robot* days.⁷⁶ As one observer has said: "these things happen so frequently, and other extorted days of labour, which the peasant fears to refuse, occur so often, that I remember, when in conversation with a very intelligent Director, I was estimating the labour of each peasant at 104 days, —he immediately corrected me, and said I might double it."⁷⁷

The other principal obligation of the peasant to his lord was the *Neunten*, i.e., the ninth of his gross product which he had to pay the lord annually. In many places this payment was a tenth.⁷⁸ Besides the *Robot* and the *Neunten* there were a host of other dues and services. To mention a few, the peasant had to pay a yearly rent of one florin for his house; give two spring chickens, two capons, twelve eggs, and a set amount of butter each year; supply a certain quantity of wood; spin into thread several pounds of flax and hemp; and so on. He was not allowed to hunt or fish, for these were privileges of the nobility alone; nor could he make his own beer or whiskey, since their manufacture was the monopoly of his lord.⁷⁹ Aside from these obligations to the *Grundherr*, the peasant was compelled to give a tenth of certain of his crops to the Church. This was not required of the noble landowner. The products from which this tenth, or *Zehent*, had to be given were set by law.⁸⁰

⁷⁵ *Ibid.*, 26-27.

⁷⁶ *Ibid.*, 51; Bright, *Travels from Vienna through Lower Hungary*, 115.

⁷⁷ Bright, *Travels from Vienna through Lower Hungary*, 115.

⁷⁸ Mailáth, *Das ungrische Urbarialsystem oder des Grundherrn und des Bauers Wechselverhältniss in Ungern*, 58-59.

⁷⁹ For a complete listing of the peasant's obligations before 1836 see *ibid.*, 26-47. Also, cf. Bright, *Travels from Vienna through Lower Hungary*, 116-118.

⁸⁰ Mailáth, *Das ungrische Urbarialsystem oder des Grundherrn und des Bauers Wechselverhältniss in*

After paying all his obligations to lord and Church, the peasant was compelled to bear almost the entire tax burden. The Hungarian tax system was founded on the principle that taxes fell not on the land but on the person, and that the nobility was tax free.⁸¹ Men of noble birth who owned all the land were exempt from the land tax which was levied on landowners in all other provinces and which was the most important single source of governmental revenue.⁸² The peasant was compelled to pay a type of income tax which was measured by the amount and value of the land he used.⁸³ He was also subject to the many tolls that were levied, from which the noble was free.⁸⁴ He had to labor on public works, submit to the quartering of troops, and was held to the *Vorspann*.⁸⁵

A large number of peasants in Galicia, like the Hungarian peasants, were usufructuaries. They had no power to sell or bequeath this right, although their children could expect to use the holding after them. In return for their use of the land, the peasants performed the usual dues and services. The lord could remove the peasant from the land, although his reason had to be approved by the district governmental official. The peasant could leave the land only if he got permission from the

Ungern, 56-57. The products of which the tenth had to be given were wheat, rye, barley, oats, millet, hemi-carp, wine, lambs, goats, and bees.

⁷⁵ *Ibid.*, 15.

⁷⁶ Turnbull, *Austria*, 2:332. For government revenues, cf. *Tafeln zur Statistik der österreichischen Monarchie*, 1841-1847, tables of tax revenues.

⁷⁷ Mailáth, *Das ungrische Urbarialsystem oder des Grundherrn und des Bauers Wechselverhältniss in Ungern*, 15.

⁷⁸ John Paget, the English agriculturist, while traveling in Hungary in 1835, asked a toll collector how he and his colleagues distinguished between the toll-exempt nobles and the toll-paying commoners. The reply was that the practice was to stop all those whom they thought were likely to pay. If the challenged person refused to pay the toll he was permitted to pass. The nobility generally wore coats, however, thereby simplifying the task of the toll collector. John Paget, *Hungary and Transylvania; with Remarks on Their Condition, Social, Political, and Economical*, 1:244-245 (London, 1850).

⁷⁹ *Ibid.*, 1:312; Bright, *Travels from Vienna through Lower Hungary*, 112-113; Tebeldi, *Die Geldangelegenheiten Österreichs*, 215-216.

lord and found a suitable peasant to take his place.⁸⁶

A distinct type of servile land tenure was in use in the Military Frontier, a long, narrow strip that reached along the Hungarian-Turkish border from Transylvania to the Adriatic Sea. The original intent of this cordon was to protect the Monarchy against a dual scourge—Turk and plague. All of this land was owned by the Crown, for the devastations of centuries of war and disease had driven out the original owners. Peasants were granted sessions in return for military service. These settlers were organized into small communities with sometimes as many as sixty session holders in it, and chose a patriarch from among their number to be their responsible head. The unit that was thus formed—frequently all its members were of one family—held everything communally. All the produce was divided equally among the members of the community, with the patriarch and his wife getting double shares. The peasants could not bequeath, lease, or divide their land, for they had no proprietary rights. Like the Hungarian tillers, they were usufructuaries. This right was inherited, and failing a direct heir, the holding reverted to the Crown. In return for the land the men of the family performed military service in the border regiments, had to be always ready to pick up their arms for active service, did *Robot* work on the lands of the Crown, and labored on public works and military fortifications. Close and constant check was kept on the peasants by army officials who performed the paternalistic functions of the *Grundherr*. Justice was administered by military courts.⁸⁷

Although the most widespread sort of peasant tenure was of a servile nature, there was a variety of other types in use during the *Vormärz*. First, there were the free, landowning peasants. They were most numerous in northern Tyrol, the Saxon colonies in Transylvania, the Mountain zone of Lombardy, and in northern Dalmatia. Scattered throughout the rest of the Monarchy were a relatively small number who had taken advantage of the laws permitting commutation and had become freemen.⁸⁸

⁸⁶ Heintl, *Die Landwirtschaft des österreichischen Kaiserthumes*, 1:120.

⁸⁷ G. R. Gleig, *Germany, Bohemia and Hungary, Visited in 1837*, 3:283 (London, 1839); Bright, *Travels from Vienna through Lower Hungary*, 487-494; Martmont, *Voyage du Maréchal duc de Raguse . . .*, 1:92-94.

The northern Tyrolean peasant, who was of German stock, had long been equal before the law with all other classes, and had the right to be represented in the provincial estates.⁸⁹ The usual Tyrolean freehold, however, was a tiny corner of barren, Alpine land from which the peasant-owner was barely able to eke out his living.⁹⁰ The Saxons, invited centuries before to emigrate to Transylvania by the rulers of that land, had been promised personal freedom. Through the years, the descendants of the original settlers had preserved their identity and their liberty, owing allegiance only to the Crown and having no class distinctions among themselves.⁹¹ The free Italian peasants of the Lombard mountains had small pieces of land and, like their German brothers of northern Tyrol, had difficulty in maintaining themselves at a subsistence level.⁹² In Dalmatia the free peasant lived almost entirely in the so-called *nuovo acquisto*, the northern part of the mainland.⁹³

Tenure on the basis of a fixed rent or of shares was another way in which land was held. This type was most prevalent in southern Tyrol, Lombardy, Venetia, and in parts of Dalmatia. In southern Tyrol, peopled with Italians, much of the land belonged to absentee owners. Such a proprietor would make a contract with the peasant to cultivate his estate, agreeing to pay a fixed amount; the crop was turned over in its entirety to the owner. Labor was hired by the contracting peasant.⁹⁴

In Lombardy the peasants of the Hill zone worked their farms on shares (*mezzadria*) or paid a fixed grain rent; money leases were rare. The lessees who worked the latifundia of the irrigated Plain were also renters. They could hardly be called peasants, however, since the estates they rented from their absentee owners required the possession of considerable capital for their operation and gave employment to a large number of laborers. The lease of the renter was accompanied by an inventory (*consegna*) that described the property in minute detail. At the expiration of

⁸⁸ Grünberg, *Bauernbefreiung*, 1:368.

⁸⁹ Grünberg, "Grundentlastung," 5.

⁹⁰ Henry D. Inglis, *The Tyrol; with a Glance at Bavaria*, 1:177-178 (London, 1833).

⁹¹ Paget, *Hungary and Transylvania*, 2:351-353.

⁹² Kent Roberts Greenfield, *Economics and Liberalism in the Risorgimento*, 2-3 (Baltimore, 1934).

⁹³ F. Petter, *Dalmatien in seinen verschiedenen Beziehungen*, 1:3, 114 (Gotha, 1857).

⁹⁴ Inglis, *The Tyrol*, 2:100-103.

the lease the renter was credited with all improvements he had made, and, with appropriate allowances for depreciation, was charged with any damage. The effect of the *consegna* was to stimulate the renter to make improvements, since he not only drew benefits during his occupancy from the increased revenue resulting from the improvements, but also got back the money they had cost him when the lease ran out.⁹⁵

In Venetia most of the cultivators were also lessees. It was estimated in 1825 that only one out of two hundred owned any part of the land he tilled, while only one in a thousand owned all of it. The usual lease, called the *affitto*, provided for a fixed payment in grain and wine and, frequently, small payments in barnyard products. In case of a mishap, whereby the peasant lost more than a third of his crop, he was allowed to deduct a certain amount from his rental. In some cases a money rent was stipulated, but often the tenant lacked the cash and the landlord took produce valued at its market price. The *affitto* usually ran for four or five years. If, during this period, the tenant made improvements in the property, the owner was certain to raise the rental at the renewal of the lease. This effectively dissuaded the peasant from attempting improvements. Another type of lease, the *livello perpetuo*, avoided this inconvenience. Here a document was drawn up in which the property was fully described, appraised, and the rent set as a certain rate of interest on the capital value. Allowances were made for crop failures, hail and flood damages, and taxes. At the end of each year the lessee could leave and the landlord was obligated to pay him for the improvements he had made. This type of lease was used mainly in renting hitherto untilled areas, where the tenant made the land cultivable.⁹⁶

In the islands and along the coast of Dalmatia

⁹⁵ Greenfield, *Economics and Liberalism in the Risorgimento*, 4-8, 16-21.

⁹⁶ *Ökonomische Neuigkeiten und Verhandlungen: Zeitschrift für alle Zweige der Land und Hauswirtschaft ... im österreichischen Kaiserthum und dem ganzen Deutschland*, 29:714-715 (1825).

share cropping was the usual form of tenure. The peasant paid from one-fourth to one-sixth of his produce to the landlord as rent. Cattle, too, were let out by their proprietor to a shepherd, who received a certain percentage of the herd's product as his reward.⁹⁷ In that part of Dalmatia which had been the Republic of Ragusa in Napoleonic days, land was held by a system which stood between leasehold and servile tenure. It was called *contadinaggio*. The landowner (*padrone*) rented land to the peasant (*contadino*) in return for a fixed payment in money or kind or for an aliquot share of the yield of the holding. The peasant had an hereditary right to the leasehold. In many cases he also had rights in the common pasture and in the forest. Frequently the *padrone* supplied a house for the *contadino*. In this event the latter was obliged to perform a labor service (*Robot*) on land of the *padrone* which lay within the boundaries of the quondam Republic of Ragusa. The landlord had to support the peasant while he was performing this *Robot*.⁹⁸

The *Robot* had been limited in 1800 by the Ragusa government to ninety days a year, and minimum standards had been set for the keeping of the peasant during this period. In 1815 the Austrian administration ordered that no more than three days of *Robot* could be done in one week, and that the *contadino* did not have to go more than five hours distance from his dwelling to perform his labor service. This law was changed in 1836. A maximum of nine consecutive *Robot* days was now permitted and the *contadino* could be compelled to go more than five hours distance from his home to do his labor rent. The new enactment also contained permission for the commutation of the *Robot* for an annual payment of five florins.⁹⁹

⁹⁷ J. M. von Liechtenstern, *Reisen durch das österreichischen Illyrien, Dalmatien und Albanien im Jahre 1818*, 2:88-90 (Meissen, 1822); F. Petter, *Das Koenigreich Dalmatien*, 1:15 (Wien, 1841).

⁹⁸ Schiff, *Agrarpolitik*, 1:552-553.

⁹⁹ *Ibid.*

THE HISTORY OF INDUSTRIAL FELLOWSHIPS IN THE DEPARTMENT OF PLANT PATHOLOGY AT CORNELL UNIVERSITY

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The history of research in plant pathology and its application to the control of plant diseases as developed at Cornell University is rooted in the period during which I. P. Roberts served as the first dean of the College of Agriculture and director of the Experiment Station (1888-1903). The men chiefly concerned in initiating plant-disease research at the institution were the botanists, William R. Dudley, George F. Atkinson, and B. M. Duggar, and the horticulturists, E. G. Lodeman and L. H. Bailey. The work of the botanists on plant diseases was largely mycological, while the horticulturists conducted field experiments with fungicides to control the commoner diseases, such as potato blight and apple scab. The work on plant pathogens and their control was not important at this time as compared with other fields of plant science and agriculture.

L. H. Bailey shortly became the transformer of the Cornell College of Agriculture and Experiment Station into the *New York State* College of Agriculture and Experiment Station at Cornell University, established by the legislature on May 9, 1904. Through his years as professor of horticulture, he had acquired a first-hand knowledge of the many problems confronting New York State farmers and fruit growers. The devastation caused by diseases and pests and the relatively little attention given to the matter both by the growers and the scientists at the University impressed him deeply. In planning for new departments in the College of Agriculture and Experiment Station, he decided to remedy this situation at the earliest opportunity.

During my graduate years (1902-06) at Cornell, I served as assistant to Professor Atkinson, the botanist of the Experiment Station, and did most of the work on plant diseases. At the request of Dean Bailey, I taught a course in "farm botany" during the winters of 1904-05 and 1905-06. It

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dealt chiefly with plant diseases and was for winter-course students. In the spring of 1906, he disclosed to me his intention of establishing a department of botany and offered me the job of organizing it. The following autumn I was made assistant professor of botany and head of the department. Although I planned and announced certain courses in agricultural botany for the academic year 1906-07, I was able to give only two courses, due to limited equipment and facilities. These were in plant pathology; one was for regular undergraduates and the other for winter-course students. At the same time I continued the investigations on fire blight, bean anthracnose, and other diseases which I had begun as assistant to Professor Atkinson. During these four years, my investigations and also lectures at farmers' institutes brought favorable relationships with farmers and fruit growers all over the State. The farmers' increased interest in plant diseases and my own experience with phytopathological problems showed me that possibilities of developments and progress in this field.

In the summer of 1907 I decided to devote my efforts entirely to the development of plant pathology as a field for teaching and research. I went to Dean Bailey with the request that my title be changed from assistant professor of botany to assistant professor of plant pathology and that I be relieved of responsibility for the work in other phases of botany. Apparently astonished at my temerity in suggesting an entirely new kind of chair in university faculties, he, nevertheless, consented to put my proposal before the Board of Trustees of Cornell University. When my reappointment came through that autumn, it carried the title of assistant professor of plant pathology and head of the new department. I soon found that the sum which the Dean was able to assign for the maintenance of the department was quite inadequate to meet the demands for the solution of plant-disease problems of pressing importance in the State, and I began to cast about for other sources of funds for research.

During the spring of 1907 I chanced upon the article by Robert Kennedy Duncan on "Temporary Industrial Fellowships" in the *North American*

Review, 185:54-62. (See also the same author's "Industrial Fellowships," *Science*, 29:736-738, May 7, 1909). This article described the newly created fellowships for chemical research at the University of Kansas and supplied the key to my quandary. I determined to enlist the cooperation of groups of growers and commercial concerns then pressing me for solution of their plant-disease problems. Selecting one of the most urgent current problems, the value of lime-sulfur solution as a substitute spray for Bordeaux mixture in the control of apple scab, I cautiously approached the Niagara Sprayer Company of Middleport, New York, then a small concern pushing commercial lime-sulfur as a summer spray. Having succeeded in selling the officers of this company the idea of establishing a fellowship, I next appealed to Dean Bailey to get the trustees of the University to accept it. Again he did not fail me, and in the spring of 1909 the first industrial fellowship at Cornell University was established. It carried the sum of \$1,500 annually for a period of two years for investigating the problem. Erret Wallace, my first undergraduate to specialize in plant pathology, received the fellowship.

The results of our investigations under this first fellowship were so favorable that within three years the apple growers of the State had largely shifted to lime-sulfur as a substitute for Bordeaux mixture in the control of apple scab. Not only was the disease effectively controlled but the appearance of the fruit was markedly superior to the russeted apples resulting from the use of Bordeaux mixture. It was an outstanding event in the history of apple growing not only in New York State but throughout the country as well. The donors as well as the fruit growers profited handsomely from the results of this investigation.

In the autumn of the same year, a second fellowship was established by the C. W. Stuart Company, nurserymen at Newark, New York. On January 21, 1911, in an address before the Massachusetts Horticultural Society in Boston, I was able to announce that "already *eight* industrial fellowships have been established in the department of plant pathology by growers and commercial firms interested along lines of plant disease control." These eight fellowships provided a total of \$14,500 in cash to finance research for a period of four years. In addition, \$3,600 was allotted to the department from State funds for other research. Miscellaneous contributions for the same period from growers in the State amounted to \$1,000 for the same purpose.

If the value of the equipment to implement the work of the fellows and research assistants purchased with State funds, is added, the total represented in those days a very tidy sum for research on plant diseases.

These fellowships increased rapidly in number and cash value. By July 1, 1913, when Dean Bailey retired, there had been or were in operation 16 industrial fellowships in the department of plant pathology, and by July 1, 1922, when I retired as head of the department to devote full time to teaching and research, these fellowships had reached a total of 33. During a period of 14 years, they had provided the department with the very substantial sum of \$59,438.26 for research. From the establishment of the first of these fellowships in the spring of 1909 to January 31, 1944, no less than 58 fellowships in plant pathology had been established at Cornell University by 44 different donors, the equivalent of over 200 annual fellowships with a total cash value of \$265,919.34.

It was early found that the cost to the department in supervision, equipment, and administration of the work was approximately equal to the value of the fellowships themselves. Thus the State was compelled to provide increasing allotments to the department of plant pathology to meet these requirements. If we add to the total amount provided by the donors of these fellowships an equivalent sum from State funds as well as the value of land rentals, labor, and other items contributed by farmers and growers in the localities where the investigations were pursued during the growing season, we may conservatively say that well over half a million dollars have been made available to the department during the past 36 years. However, it should not be assumed that these fellowships have been the only source of funds for research in the department of plant pathology. Generous appropriations for special investigations of plant-disease problems urged upon the legislature by groups of growers have been assigned to the department through these years.

The investigations thus financed, with few exceptions, have been conducted during the growing season in the fields, orchards, and greenhouses of the growers in the localities best suited to the study of the problems involved. The growers cooperated generously by contributing land, labor, seed, and machinery necessary for conducting the experiments and demonstrations. In most cases the growers provided suitable rooms or buildings for the temporary field laboratories that were set up.

Frequently, they also provided the fellow with the necessary means of transportation. In the early days it was a horse and buggy, a bicycle or motorcycle, and later an automobile.

The fellow's stipend during the early years was usually \$750 the first two years for an 11-month year and \$1,000 the third and fourth year. Later, as the cost of living rose, these stipends were increased to \$1,000 for the first two years and to \$1,200 to \$1,500 in succeeding years. The usual fellowship also provided for the fellow's board and room while in the field. During the winter months the fellow returned regularly with his laboratory equipment to Ithaca to pursue his graduate training, to write the report on his summer's work, and to carry forward such phases of his research as could be done during the winter. His reports were mimeographed annually and sent to the donors of the fellowship. On completion of his service, the fellow usually received his doctor of philosophy degree, and his thesis, ordinarily devoted to some aspect of the problem on which he had worked, was published as a memoir or bulletin of the college or in a scientific periodical.

While the problem for which the fellowship was established was not always solved, the growers were usually fully repaid in such cases by their adoption of improved methods of controlling different diseases of their crops. As an example of this may be related briefly the story of the first three years' operation of the fellowship established at Williamson, New York, on April 1, 1917, to control bottom rot in lettuce, a fungus disease which took annually a heavy toll in this muck-grown crop. Only 12 of more than 125 growers were willing to risk their share of the \$750 needed annually for the first two years to finance the fellowship. At the end of three years, \$2,500 had been spent on the fellowship. The control of lettuce bottom rot was still unsolved, but by putting the methods demonstrated by the fellow for the control of onion smut and celery blight into practice, the 12 donors netted no less than \$35,000 in increased yields and quality of these two crops alone. This is but one example of the results obtained through these fellowships. The results of these investigations, recorded in college bulletins, scientific publications, and in farm papers and horticultural journals, were made available not only to the donors but to all interested persons throughout the State, the Nation, and the world.

One of the practical advantages of conducting research through industrial fellowships lies in the

cooperative nature of the undertaking. Growers who have invested substantially half of the funds out of their own pockets are quick to interest themselves in the findings and to put into practice the improved methods that are thus discovered and demonstrated under their own eyes. This is in marked contrast to the critical attitude and frequent indifference of growers to the results obtained from research financed entirely by the State. Moreover, out of the limited associations of small groups of growers financing these fellowships, there grew broad and permanent growers' associations which have played no small part in the remarkable growth of agricultural cooperation in the State.

There is another feature of these fellowships that should not be overlooked. Not only have they provided funds for the investigation and solution of problems in plant diseases but they have also made possible the training of no less than 50 young men, most of whom have already made their mark in the field of phytopathology as investigators, teachers, or administrators in State or Federal agricultural institutions. Of the 67 who have held one of these fellowships, 42 have received the doctorate degree at Cornell University and 2 elsewhere; 31 have become research professors or teachers in colleges or universities (9 at Cornell); 18 have become investigators (of professorial status) in the Federal service or in commercial organizations; 2 have turned to farming; and 6 are currently fellows in the department of plant pathology at Cornell.

The training that these fellows acquire in conducting their research during the growing season in fields, gardens, and greenhouses gives them an experienced professional standing unusual in the training of plant pathologists at most other institutions. The practical application of the methods and principles of their profession gives them a decided advantage in competing for their initial position in other institutions or commercial organizations. This practical experience is equivalent to the internship in the medical profession. At least four or five years of graduate work are required for the training of the young plant pathologist at Cornell University. They may not enter graduate work in plant pathology until they have obtained a bachelor's degree from an approved college or university. The time required and the character of their training approximates closely that of the medical student.

The following appendix shows in some detail the

different fellowships, the donors, the cash sums involved, the purpose or problems, and the number of years each was continued.

APPENDIX

July 1, 1909. Niagara Sprayer Co., Middleport, N. Y. Fellowship No. 1. The fungicidal value of lime sulfur for the control of fruit diseases, especially apple scab and peach leaf curl, at various places in New York State, Erret Wallace, 1909-10, 10-11, \$1,500 each year.

Sept. 1, 1909. C. W. Stuart & Co., nursery, Newark, N. Y. Diseases of nursery stock, especially fire blight, at Newark, N. Y. V. B. Stewart, 1909-10, 10-11, \$750 each year.

July 1910. Union Sulfur Co., New York City. Fellowship No. 1, known as the Herman Frasch Fellowship and providing for 4 fellows annually for 4 years. Dry (ground) sulfur as fungicide for plants and soil. F. M. Blodgett and C. N. Jensen, 1910-11, \$3,000. F. M. Blodgett, C. N. Jensen, and C. D. Sherbakoff, 1911-12, \$4,000. F. M. Blodgett, F. C. Faulwetter, I. C. Jagger, and C. D. Sherbakoff, 1912-13, \$4,000 plus \$232.51 from sale of products; and 1913-14, \$4,000 plus \$211.94 from sale of products. Dr. D. Reddick and Dr. C. R. Crosby (department of entomology), for dusting experiments, 1914-15, unused balance plus \$30 from sale of products; 1915-16, unused balance; and miscellaneous work, 1917-18, balance plus \$200.

April 1910. Davy Tree Expert Co., Kent, Ohio. Diseases of shade, ornamental, and fruit trees, especially heart rots. W. H. Rankin, 1910-11, 11-12, \$750 each year.

October 1910, for 1 year. Wessel Ten Broeck Fruit Growers, Hudson, N. Y. Effect of cement dust on fruit trees. P. J. Anderson, \$750.

January 1911. Byron Fruit Growers Assoc., Byron, N. Y. Canker diseases of apple trees and spraying demonstrations. L. R. Hesler, 1911-12, \$750; 1912-13, \$375.

June 1911, for 1 year. Bethany-Batavia Fruit Growers Assoc., Batavia, N. Y. Investigation and demonstration of control of apple scab and other diseases of fruit trees. R. W. Braucher and G. Osner, \$2,000.

September 1911, for 1 year. Newfane Fruit Growers Assoc., Newfane, N. Y. Brown rot and canker of peach trees. R. A. Jehle, \$730. Preliminary to the fellowship, the firm employed Jehle from Apr. 1 to Aug. 31, 1910, at \$10 per week.

October 1911. Stuart Co., Chase Bros., Brown Bros., and Jackson & Perkins, nurseries, of Seneca Castle, Honeoye Falls, and Clifton Springs, N. Y. Nature and control of diseases of nursery stock. V. B. Stewart, 1911-12, \$2,600; 1912-13, \$2,000. In effect, a continuation of the fellowship established Sept. 1, 1909.

1911-12, for 1 year. W. G. Rogers, muck grower,

Williamson, N. Y. Diseases of muck crops. I. C. Jagger, \$750.

May 1, 1911. American Steel & Wire Co., New York City. Investigation and demonstration of fungicidal value of iron sulfate. E. Wallace (2 mo.) and P. J. Anderson (10 mo.), 1911-12, \$2,200. J. H. Muncie, 1912-13, \$2,000. W. H. Burkholder and C. G. Crittenden, 1913-14, balance (\$2,176.99); and 1914-15, balance (\$1,177.15).

July 1912. Genesee County Fruit Growers Assoc., Batavia, N. Y. Diseases and pests of apple orchards. R. W. Braucher, L. R. Hesler (3 mo.), and G. Osner, 1912-13, \$1,415.94 plus \$247.61 from Byron and Batavia fellowships and sale of motorcycle. G. Osner, 1913-14, \$1,000; and 1914-15, \$891.32. E. E. Honey, Apr. 1-Sept. 30, 1917, \$487.50. In effect a continuation of the June 1911 fellowship.

October 1913-Sept. 30, 1914. C. W. Stuart & Co., and Chase Bros., nurseries of Honeoye Falls and Seneca Castle, N. Y. Diseases of nursery stock. V. B. Stewart, \$1,200.

October 1912. Champlain Valley Fruit Growers Assoc., Peru, N. Y. Fellowship No. 1. Nature and control of orchard diseases and pests. A. J. Mix, 1912-13, \$1,000; 1913-14, \$915; and to Oct. 1, 1915, \$910.

September 1912, for 1 year. Orleans County Fruit Growers Assoc., Albion, N. Y. Nature and control of fruit-tree diseases. J. L. Weimer, \$940.

Mar. 1, 1914, for 1 year. U. S. Brewers Assoc. and N. Y. Brewers Assoc., Waterville, N. Y. Diseases and pests of hops. C. L. Slocum, \$1,000. This investigation was continued by F. M. Blodgett on a Union Sulfur Co. fellowship.

Apr. 1, 1915. Bean Growers Assoc. of the Wyoming County Farm Bureau, Perry, N. Y. (and the Granges of Genesee County). Diseases of beans. W. H. Burkholder, 1915-16, \$710; and 1916-17, \$663.50.

Apr. 1, 1917. Williamson Vegetable Investigation Assoc., 12 growers of Williamson, N. Y. Diseases of muck crops, especially lettuce, onions, and celery. H. W. Dye, 1917-18, 18-19, \$750 each year; and 1919-20, \$1,000. A. G. Newhall, 1920-21, 21-22, \$1,000 per year; (1922-23, fellowship suspended); and 1923-24, 24-25, \$1,250. J. G. Gaines, 1925-26, 26-27, \$1,000 each year; and 1927-28, 28-29, 29-30, \$1,250 each year. A. L. Harrison, 1930-31, \$583.31 plus balance (\$416.69); and 1931-Mar. 31, 1932, \$1,000. These growers invested a total of \$14,333.31 during the 14 years.

Apr. 1, 1919, for 1 year. Greenlawn Pickle Growers Assoc., Greenlawn, Long Island. Diseases and pests of cucumbers and other crops. I. H. Vogel, \$1,000.

May 1, 1919. Wilson Growers Assoc., Wilson, N. Y. Diseases of tomatoes, peas, and other field and canning crops. R. P. White, 1919-20, 20-21, \$1,000 each year.

Apr. 1, 1920. Eden Valley Growers Assoc., Eden Valley, N. Y. Nature and control of diseases and pests

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of market garden crops. L. O. Gratz, 1920-21, 21-22, \$1,000 each year.

Apr. 1, 1920, for 1 year. Hampton Potato Growers Assoc., Bridgehampton, Long Island. Diseases and pests of potatoes. O. C. Boyd, \$1,000.

Apr. 1, 1920. North Fork Vegetable Growers Fellowship Assoc., Mattituck, Long Island. Diseases and pests of cabbage, cauliflower, lima beans, etc. I. H. Vogel, 1920-21, 21-22, \$1,250 each year.

Apr. 1, 1920. Steuben Co., seed improvement, Bath, N. Y. Potato diseases. K. H. Farnow, 1920-21, 21-22, \$1,000 each year.

Apr. 1, 1920. Union Sulfur Co., New York City. Two new fellowships, one in plant pathology and one in entomology, Fellowship No. 2, known as the Herman Frasch Fellowship. Dusting as a method of applying fungicides and insecticides. I. P. Schlatter, 1920-21, \$4,000 (no entomologist fellow appointed). O. C. Boyd and H. W. Fitch, 1921-22, 22-23, \$4,000 each year. H. W. Fitch and A. L. Pierstorff, 1923-24, \$4,000; and 1924-25, balance of \$3,435.53. R. E. Newlands, 1925-26, \$4,125. The fellowship was not renewed for a seventh year, but the balance of \$2,250.43 was donated to the department for such use as it saw fit.

Apr. 1, 1924. Union Sulfur Co., New York City. Fellowship No. 3. Dust control of cereal rusts. C. V. Kightlinger, 1924-25, 25-26, \$1,000 each year; and 1926-27, \$1,250 (balance of \$279.55 plus \$970.45 from Herman Frasch Fellowship balance). At the end of the third year, the unused balance of \$720.49 was donated to the department for such use as it saw fit.

Apr. 1, 1924. Western New York Farms Corporation, Elba, N. Y. Diseases and pests of muck crops. E. L. Felix, 1924-25, 25-26, and H. T. Cook, 1926-27, 27-28, \$1,000 each year.

May 1, 1924. The Bayer Co., Inc., New York City. Chlorophenolate of mercury (uspulun) as a disinfectant for control of plant diseases. J. S. Wiant, 1924-25, 25-26, \$1,000 each year; and 1926-27, 27-28, \$1,250 each year.

Apr. 1, 1926. Champlain Valley Fruit Growers Assoc., Peru, N. Y. Fellowship No. 2. Nature and control of apple diseases and pests, especially cork and drouth spot. A. B. Burrell, 1926-27, 27-28, \$1,000 each year; and 1928-29, \$1,250.

Oct. 1, 1927. Lily Disease Investigation Fellowship, a cooperative project of the New York State College of Agriculture, the Boyce Thompson Institute, the Horticultural Society of New York, and the New York Botanical Garden, at Yonkers and Ithaca, N. Y. C. E. F. Guterman, 1927-28, 28-29, \$2,300 (N.Y.S.C.A., \$150; B.T.I., \$1,150; H.S.N.Y., \$1,000) each year; and 1929-Oct. 1, 1929, \$2,700 (N.Y.S.C.A., \$150; B.T.I., \$1,350; H.S.N.Y., \$1,200). D. K. O'Leary, 1931-32, 32-33, \$2,300 (same donors and items as in 1927-28); and 1933-34, 34-35, 35-36, 36-37, \$1,600 (N.Y.S.C.A., \$150; B.T.I., \$1,350; dept. of plant pathology, Cornell Univ., \$100), each year. E. P. Imle 1937-38, \$1,750

(B.T.I., \$1,000; bulb companies and growers, \$600; N.Y.S.C.A., \$150); 1938-39, \$1,825 (same donors and items as in 1937-38); 1939-40, \$1,590 (B.T.I., \$1,200; Cornell Agr. Expt. Sta., \$150; lily growers, \$240); 1940-41, \$1,350 (B.T.I., \$1,200; N.Y.S.C.A., \$150); 1941-Jan. 31, 1942, \$1,700 (B.T.I., \$1,550; \$150).

Oct. 1, 1927. Oswego Farm Bureau and Oswego Vegetable Growers Assoc. Diseases of crops, with emphasis on control, especially of lettuce bottom rot. G. R. Townsend, 1927-28, 28-29, \$1,000 each year; (grant suspended 1929-30); Apr. 1-Sept. 30, 1930, \$740; 1931-32, \$950; 1932-33, \$1,000 (Oswego and Fulton vegetable growers, \$500; Bayers-Semesau Co., \$500). The balance from this fellowship was used during 1933-34 to complete certain experiments on this project.

1928. Genesee-Orleans Co., vegetable growers cooperative, Elba, N. Y. Diseases and pests of muck crops. H. T. Cook, 1928-29, 29-30, \$1,250 each year. W. W. Stuart, 1930-31, 31-32, \$1,000 each year; and 1932-33, \$1,250.

Apr. 1, 1928. Niagara Sprayer & Chemical Co., Middleport, N. Y. Fellowship No. 2. Factors involved in the application of fungicidal dusts for control of diseases and pests of orchard crops at Geneva, N. Y. C. G. Small, 1928-29, 29-30, \$1,500 each year; and 1930-31, 31-32, 32-Mar. 31, 1933, \$1,750 each year.

June 1-Dec. 1, 1928. Armstrong Tree Service, Ltd., Poughkeepsie, N. Y. Diseases of shade and ornamental trees. E. T. Erickson, \$1,010. Originally set at \$1,250; \$696.42 spent; balance of \$313.58 returned to donor.

Apr. 1, 1929. American Rose Society. Diseases of roses with special reference to methods of control at West Grove, Pa. L. J. Meyer, 1929-30, \$1,250. B. Parsons, 1930-31, 31-32, 32-33, \$1,250 each year. Balance used during 1933-34 to complete the work.

Apr. 1, 1929. Nassau County Farm Bureau, Mineola, Long Island. Diseases of truck crops grown by members. P. P. Pirone, 1929-30, 30-31, \$1,200 each year; 1931-32, 32-33, \$1,450 each year. M. C. Richards, 1933-34, 34-35, \$1,200 each year; and 1935-36, 36-37, 37-38, \$1,450 each year. O. S. Cannon, 1938-39, 39-40, \$1,200 each year; and 1940-41, 41-42, \$1,450 each year. F. M. Gordon, 1942-43 (9 mo.), \$1,012.50; and 1943-44, \$1,280. This fellowship is being continued.

Oct. 1, 1929, for 1 year. S. D. Woodruff & Sons, Orange, Conn. Diseases of canning beans and demonstration of control methods at Adams, N. Y. C. C. Wernham, \$1,000.

May 1, 1931. New York Florists' Club, New York City. Fellowship No. 1. Diseases of cyclamen and other pot-grown plants at Ithaca, N. Y. D. L. Gill, 1931-32, 32-33, \$950 each year; 1933-34, 34-35, \$1,250 each year; and to July 1, 1935, \$1,000. J. M. Bickerton, 1936-37, \$1,000. Carnation diseases on Long Island. J. M. Bickerton, 1937-38, \$1,600; 1938-39,

\$1,650; 1939-40, \$1,606.07; 1940-41, \$1,500 (leaving balance of \$267.64; see next fellowship).

May 1, 1931. New York Florists' Club, New York City. Fellowship No. 2. Diseases of greenhouse roses at Ithaca, N. Y. E. W. Lyle, 1931-32, 32-33, \$1,450 each year; 1933-34, 34-35, 35-36, \$1,550 each year (from 1934-35 to July 1, 1936, the work was done at Rowayton, Conn.); and 1936-37, \$1,000. W. D. McClellan, 1937-38, 38-39, 39-40, \$1,000 each year; and 1940-41, \$800, plus balance of \$267.64 from the carnation fellowship, leaving balance of \$509.51. M. B. Linn and V. W. Cochran, summers of 1941 and 1942, balance (\$509.51), at \$100 for 2 months.

October 1931. Niagara Sprayer & Chemical Co., Middleport, N. Y. Fellowship No. 3. Efficiency of fungicidal materials, including the testing of fungicides developed by the company and laboratory testing and techniques. R. A. Hyre, 1931-32, 32-33, 33-34, 34-35, \$1,500 each year; continued on the balance of \$1,615.12 through October 1936.

Apr. 1, 1932. Roger Bros. Seed Co. Diseases of beans transmitted through the seed for production of pathogen-free seed at Geneva and Ithaca, N. Y. A. L. Harrison, 1932-33, 33-34, \$1,500 each year; 1934-35, 35-36, and to Oct. 1, 1936, \$1,600 each year.

Nov. 1, 1932. Staten Island Growers Assoc. Diseases and injuries (by noxious gases) of vegetable and florist crops of members. M. B. Linn, 1932-33, 33-34, \$1,500 each year; 1934-35, 35-36, \$1,600 each year; 1936-37, 37-38, 38-39, and Nov. 1, 1939-Mar. 1, 1941, \$1,750 each year. A. A. Foster, 1941-42, 42-43, \$1,500 each year; and 1943-44, \$1,550 (plus balance).

May 1, 1934. North Shore Private Estates Assoc., North Shore, Long Island. Diseases and pests of ornamental plants in Nassau County. K. E. Maxwell, 1934-35, 35-36, 36-37, \$1,200 each year.

Nov. 1, 1936. Stauffer Chemical Co., and Freeport Sulfur Co., New York City. Plant injuries due to sulfur-containing materials applied as dusts and sprays. R. A. Hyre, 1936-37, \$1,000; and 1937-38, \$673.33.

Jan. 1, 1937. Texas Gulf Sulfur Co., New York City. The toxicity and efficiency of sulfur and sulfur-containing materials in the control of diseases of cereals with development of methods for applying same. K. D. Butler, 1937-38, 38-39, 39-40, \$1,500 each year; 1940-41, \$1,000 plus balance of \$221.35. An additional sum of \$1,500 was also provided for a fellow to study insect pests of fruit trees under the supervision of the department of entomology.

June 1, 1937. Freeport Sulfur Co., New York City. Fellowship No. 2 (No. 1 was for the animal husbandry department). The effect of sulfur in the form of sulfur dioxide, etc., on vegetation as measured by changes in feeding values. B. L. Richards, 1937-38, 38-39, \$2,500 each year; 1939-40, balance of \$2,349.82; 1940-41, Fellowship Nos. 1 and 2 combined and balance used.

Oct. 1, 1939. Innis, Speiden & Co., New York City. The efficiency of chloropicrin in soil disinfestation and methods of application at Ithaca, N. Y. F. L. Stark, 1939-40, 40-41, \$1,400 each year; 1941-42, 42-43, 43-44, \$1,650 each year.

June 1, 1942. Southern Pine Division of the Glidden Co., New York City. The fungicidal properties of phenolic compounds (catech) and other products for the control of onion smut, cereal smuts, potato tuber diseases, etc., at various places in New York State. William E. Rader, 1942-43, 43-44, \$1,200. This fellowship is continuing.

Apr. 1, 1943. Dow Chemical Co., Midland, Mich. The efficiency of certain soil fumigants against nematodes and methods of application at various places in New York State. Bert Lear, 1943-44, \$1,800.

SOME FERTILIZER HISTORY CONNECTED WITH WORLD WAR I

CHARLES J. BRAND

Executive Secretary and Treasurer, The National Fertilizer Association

Inevitably, because of their importance to the preparation of munitions of war and to the production of food, nitrogen carriers and sulphuric acid stand out as the chemicals that aroused the greatest agricultural public interest during World War I. There was as yet no synthetic nitrogen industry in the United States. A small arc-process plant at Niagara Falls, New York, using the Bradley and Lovejoy method, was interesting rather than important. The cyanamide plant on the Canadian side following the process of the German chemists, Caro and Frank, was in actual production. At Muscle Shoals the Bureau of Ordnance of the War

Department in 1917 and 1918 constructed the famous Muscle Shoals nitrogen plants, Plant No. 1 being intended for production by the Haber-Bosch process and Plant No. 2 by the cyanamide process. The former never produced any nitrogen, and the latter produced only a sufficient quantity to make it possible for the construction engineers to deliver the plant to the United States Government and to receive payment. It was not until August 1921 that synthetic ammonia was produced successfully in the United States by an American modification of the Haber-Bosch process which had been in large-scale use in Germany since 1913. This was

done by private enterprise at Syracuse, New York, in the plant of the Synthetic Nitrogen Corporation, a subsidiary of the Allied Chemical and Dye Corporation.

NITRATE ACTIVITIES OF THE WAR INDUSTRIES BOARD

Prior to the entrance of the United States into the war, the Council of National Defense had already been established, and attention began to be paid to chemical problems, from the standpoint both of producing munitions and of producing food, feed, and fiber for the use of the United States and that of the Allied nations.

There was a committee on chemicals as a part of the Council of National Defense, and one of its subcommittees dealt specifically with fertilizers. That committee was formed in April 1917, and the late Leland L. Summers of New York, a well-known consulting engineer, was placed at its head. The subcommittee on fertilizers was instrumental in regulating the supply of sulphur used in the production of fertilizer and, because of the importance of that material in munitions production, fertilizer manufacturers using sulphuric acid were required to obtain their sulphuric acid primarily from pyrites.

Charles H. MacDowell, head of the Armour Fertilizer Works in Chicago, was placed in charge of the chemical division of the War Industries Board, which succeeded the Council of National Defense. His appointment took effect in November 1917, though he actually began work in October. He remained in Washington in charge of nitrates for the War Industries Board throughout the war. He handled the negotiations not only within the War Industries Board and with the war services but also with the Department of Agriculture.

It was not a matter of chance that the first great battle between the German and British fleets took place off the coast of Chile near Coronel on November 1, 1914. Although the German synthetic industry was already producing nitrogen, nitrate of soda from Chile was still the most important source of nitrates for explosives. The German fleet, after its initial victory over the British fleet, had to withdraw from the scene of action. In that war, Japan was on the Allied side; hence it was the Japanese fleet that joined forces with the British and caused the Germans to leave the scene of action, only to be sunk later off the Falkland Islands leaving to the Allies free and

advantageous access to the vast Chilean nitrate production.

By April 1917, the price of nitrate of soda had advanced from $2\frac{1}{2}$ to about $7\frac{1}{2}$ cents per pound. The Allied governments were bidding against each other, and even the stability of the Chilean Government began to be in question because its gold reserve was on deposit in Berlin.

To unify purchasing and to do away with unwarranted and injurious speculation, an Allied nitrate executive was set up in London. Robert P. Skinner, the American consul general there, represented the United States. During the autumn of 1917, a purchasing pool with representatives of the United States, England, France, and Italy was set up to handle all Allied buying of nitrate in Chile. Then, and subsequently, when he became chairman of the War Industries Board's Foreign Mission to Europe in July 1918, Summers was an important factor in all negotiations. He served as chairman of the Foreign Mission.

In 1914 the United States imports of Chilean nitrate of soda were 625,000 tons; by 1916 they had risen, largely because of the munitions program, to 1,218,500 tons. In 1918 they totaled 2,066,615 tons. Although Germany produced byproduct and fixed nitrogen, it took for fertilizer purposes about one-third of Chile's total output before the war.

Although arrangements had been made to pool Allied buying in all respects, the pooling was confined in the end chiefly to price pooling with allocations to countries, especially the United States, of such supplies as were available under the distribution plan. Purchases for the account of the United States were handled through the Du Pont Nitrate Company, the W. R. Grace & Company, the Wessel-Duval & Company, and H. J. Baker & Brothers, who represented Anthony Gibbs & Company of London.

When the War Industries Board was dissolved on January 1, 1919, its organizational set-up had Bernard M. Baruch at its head, supervising all the far-flung activities of that body. George N. Peek was commissioner of finished products and had general supervision of the section devoted to manufactured goods of all kinds. Leland L. Summers, technical advisor, supervised the section dealing with unfabricated materials and chemicals. Charles H. MacDowell was in charge of the chemicals division and particularly supervised all nitrate activities. With the dissolution of the Board, the New York committee, composed of representatives

of each of the four nitrate importers and H. Ray Paige of the War Industries Board, was also liquidated.

The principal use of nitrate of soda in peace times is as a food for crop plants. Its principal use in war is for the production of nitric acid, which is used in mixture with sulphuric acid in the nitrating process for the manufacture of powder and explosives.

In summary it can be said that the heavy American purchasers of nitrate of soda during World War I, namely, the War Department, the Navy Department, and the Department of Agriculture, controlled the details of their own purchases by contracts with the importers. The Nitrate Executive in London determined the allocations to go to the various countries, and some of the conditions of sale, while the American purchases were made under the supervision of the nitrate section of the War Industries Board by each purchasing department.

The Nitrate Committee in New York calculated the monthly prices, delivered at American ports and warehouses, and also kept the Nitrate Executive in London advised as to the conditions, stocks on hand, shipments, etc., in the United States.

During the early part of United States participation in the war, importers were allowed, as far as accessible supplies permitted, to bring in nitrate of soda for their own account. Subsequently, when a commissioner of priorities was appointed by the War Industries Board and priorities were strictly enforced, unsupervised private purchasing was practically stopped.

THE FOOD PRODUCTION AND FOOD CONTROL ACTS

Many of the controls over industry and commerce, and especially over agriculture, during World War I were authorized by the Food Control Act, frequently referred to as the Lever Act because it was introduced in the Congress by Representative A. F. Lever of South Carolina, then chairman of the Committee on Agriculture of the House of Representatives. The original draft of the bill was prepared under the supervision of Charles J. Brand, then chief of the Bureau of Markets of the United States Department of Agriculture, and since July 1925, executive secretary and treasurer of the National Fertilizer Association.

The draft bill was presented to a group of about 75 agricultural authorities at St. Louis on April 9 and 10, 1917. The representatives of the United States Department of Agriculture participating in

the meeting were David F. Houston, then Secretary of Agriculture and later Secretary of the Treasury; W. A. Taylor, chief, Bureau of Plant Industry; and Charles J. Brand, chief, Bureau of Markets. Officials from the agricultural colleges of 32 States and representatives of 20 State departments of agriculture took part. Subsequently, a similar conference was held at Berkeley, California, for the States west of the Rocky Mountains. Both conferences unanimously adopted with negligible changes the programs presented by the Department of Agriculture officials. These dealt primarily with the production of sufficient foods, fibers, and feedstuffs for the United States and for the countries associated with her in the war, conservation of farm products, the mobilization of farm labor, and regulation of storage and distributing agencies.

Two bills were presented to the Congress as the outgrowth of these meetings. One was concerned with food production and the other with food control. The former primarily provided authority and appropriations to further the national security and defense by stimulating agriculture and facilitating the distribution of agricultural products. Its administration was lodged wholly in the Department of Agriculture, and it carried an appropriation of \$11,346,400 to carry out its declared purposes. Among these, so far as the chemical problem of the United States during World War I is concerned, were two that should be set forth at this point. As stated in the act, they were:

For increasing food production and eliminating waste and promoting conservation of food by educational and demonstrational methods, through county, district, and urban agents and others, \$4,348,400.

For gathering authoritative information in connection with the demand for, and the production, supply, distribution, and utilization of food . . . \$2,522,000. . . .

The Food Production Act provided funds not only for use of the Extension Service and the Bureau of Markets but also for other bureaus of the Department of Agriculture like the Bureau of Plant Industry and the Bureau of Soils that dealt with fertilizer problems. Both the Food Production and Food Control laws were approved by President Wilson on August 10, 1917. Herbert Hoover as Food Administrator handled most of the work under the latter.

The Food Control Act appropriated \$152,500,000, a small sum if compared with inflated World War II spending. The act was intended to insure an adequate supply and equitable distribution and

to facilitate the movement of foods, feeds, fuel, including fuel oil and natural gas, and *fertilizer and fertilizer ingredients*, tools, utensils, implements, machinery, and equipment required for the actual production of foods, feeds, and fuel, to prevent, locally and generally, scarcity, monopolization, hoarding, injurious speculation, manipulation, and private controls affecting such supplies, distribution, and movement; and to establish and maintain governmental control of such necessities during the war.

Under the provisions of the Food Production Act, funds were assigned to the Bureau of Markets with Charles J. Brand as chief to make a survey relative to the supply of fertilizer and fertilizer materials on hand, imports, production, and producing capacity. This survey was made under date of October 1, 1917 and was supervised by C. W. Thompson and D. S. Murph. Under Brand's direction Thompson also conducted the food surveys of the United States which were published regularly during the war and until January 1, 1918. Murph at that time was in charge of cotton marketing investigations in the Bureau of Markets. He is now administrative assistant in the National Fertilizer Association.

As a result of the fertilizer survey, reports were obtained from all branches of the fertilizer industry including importers, manufacturers and mixers, miners of phosphate rock, wholesale dealers, and retail dealers. The results were published in Office of the Secretary *Circular 104* entitled "Commercial Stocks of Fertilizer and Fertilizer Materials in the United States as Reported for October 1, 1917."

In addition to this general survey a special inquiry was made in cooperation with the States Relations Service through the county agents with regard to the immediate requirements for nitrate of soda.

A subsequent survey of the fertilizer industry was made in connection with the Fertilizer Control Office discussed below. The report on this survey was prepared by E. A. Goldenweiser, then statistician in the Office of Farm Management and presently economic advisor to the Federal Reserve System, and published with the title, "A Survey of the Fertilizer Industry," under date of October 20, 1919, as Department of Agriculture *Bulletin 798*. Goldenweiser's survey was prepared under the direction of William Wallace Mein, then assistant to Secretary Houston in charge of the wartime Fertilizer Control.

PURCHASE AND SALE OF NITRATE OF SODA TO FARMERS

The Food Control Act carried a section not originally in the bill. It was added during the congressional hearings as Section 27 and provided as follows:

That the President is authorized to procure, or aid in procuring, such stocks of nitrate of soda as he may determine to be necessary, and find available, for increasing agricultural production during the calendar years nineteen hundred and seventeen and eighteen, and to dispose of the same for cash at cost, including all expenses connected therewith. For carrying out the purposes of this section, there is hereby appropriated, out of any moneys in the Treasury not otherwise appropriated, available immediately and until expended, the sum of \$10,000,000, or so much thereof as may be necessary, and the President is authorized to make such regulations, and to use such means and agencies of the Government, as, in his discretion, he may deem best. The proceeds arising from the disposition of the nitrate of soda shall go into the Treasury as miscellaneous receipts.

Beginning in the autumn of 1917 and continuing through the first half of 1918 considerable experience was had with the purchase and distribution of nitrate of soda for farmers, as a result of which the Urgent Deficiency Act, approved March 28, 1918, contained a provision reading as follows:

The proceeds heretofore or hereafter received from the disposition of nitrate of soda under the appropriation of \$10,000,000 contained in section twenty-seven of the Act approved August tenth, nineteen hundred and seventeen, shall be credited to the said appropriation of \$10,000,000 and be available for the purposes authorized in the said section during the period of the existing war as defined by section twenty-four of the said Act.

Under the foregoing authority considerably more than 300,000 farmers ultimately received nitrate of soda at cost through the United States Department of Agriculture. It was of great value in producing food for the United States and for the countries associated with the United States in World War I.

In the fall of 1917, not long after President Wilson signed the Food Control Act, Mell R. Wilkinson, at present associated with the Ashcraft-Wilkinson Company in Atlanta, was appointed assistant to Secretary Houston to deal with the problems arising out of the nitrate appropriation. Wilkinson, a fine public-spirited citizen of great

business experience and ability, assisted in this work for several months, when he found it necessary to return to his private business.

On January 22, 1918, the activity was assigned to the Bureau of Markets in a letter of authorization to the chief signed by the Secretary of Agriculture and reading as follows:

You are hereby authorized to conduct the work of procuring and disposing of nitrate of soda authorized by Section 27 of the Act approved August 10, 1917 (Public No. 41, 65th Congress), entitled "An Act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuel," and to incur, in strict accordance with law, the decisions of the Comptroller of the Treasury, and the fiscal regulations of the Department, such expenses against the appropriation made for the purpose as may be necessary properly to carry on the work. The sum of \$10,000,000 is hereby allotted to your Bureau and made available for encumbrance during the current quarter ending March 31, 1918. Liabilities against the allotment must not in any circumstance exceed the total amount thereof.

In directing travel under this authorization, you may grant a per diem in lieu of subsistence, but such per diem allowance granted to persons performing travel within and throughout the United States in connection with this work shall be at the rate of \$4, subject to the fiscal regulations of the Department. This rate may, however, be decreased when its application would result in reimbursement in excess of actual expenses.

You are further authorized to delegate any part of this authority to the acting chief of the Bureau of Markets or to other officers or employees thereof, when, in your opinion, advisable to do so.

The purchase and distribution of nitrate of soda under Section 27 of the Food Control Act continued for two fiscal years. It began in the fiscal year 1918 and was concluded for the most part in the fiscal year that ended June 30, 1919. In addition to the assistance of D. S. Murph, the Federal nitrate distributor, Brand, had the help of George R. Argo, one of the cotton experts of the Bureau of Markets and now a cotton merchant of Atlanta, Georgia, and of James H. Collins, also one of the civil service employees of the Bureau in the Perishable Division, who later became executive secretary of the Superphosphate Institute which existed temporarily during the early 1930s.

In cooperation with the nitrate section of the War Industries Board, contracts were made for the purchase of about 120,000 short tons of nitrate of soda with the faint hope that this quantity could

be brought in early enough to be used by American farmers up to the end of the spring of 1918 fertilizer season. The necessary arrangements were made through the United States Shipping Board to transport the tonnage from Chile. After a careful study of costs and consultations with the nitrate importers who were used in handling the purchases in Chile and delivery in the United States, Brand recommended a price of \$75.50 per short ton which was approved by Secretary Houston on January 16, 1918. The same companies, namely, Du Pont, Wessel-Duval, Anthony Gibbs represented by H. J. Baker & Brothers, and W. R. Grace & Company, all of whom were cooperating with the War Industries Board, were used for handling Department of Agriculture nitrate. The price of \$75.50 was on the basis of f.o.b. cars at port of arrival.

As the nitrate purchased and sold was for delivery only to farmers and as required by statute had to be sold at cost, it was necessary that the price at the port named in the United States should include not only the original purchase price in Chile and the ocean freight but in addition all charges at the port of arrival, such as wharfage, handling, stacking, weighing, even-weighting, loading into cars, and other expenses necessarily incurred in procuring and disposing of the nitrate.

One of the important elements of the cost of nitrate f.a.s. Chilean ports was the export duty assessed by Chile which amounted to 2 shillings, 4 pence per Spanish quintal of 101.4 pounds. At that time this duty was a chief source of funds to cover the cost of operating the Chilean Government, and it was required that it be paid in gold. The amount of duty on each 25,000 tons would have been approximately \$300,000 with an estimated sterling exchange rate of \$4.76. The United States held such a favorable position with respect to the gold premium at the time that approximately \$75,000 could have been saved by the export of \$300,000 worth of gold.

With the approval of the Secretary of Agriculture and at the suggestion of Adolph Miller of the Federal Reserve Board, the chief of the Bureau of Markets made formal application to the chairman of the gold committee of the Reserve Board which was then closely controlled by the Treasury for permission to export approximately \$265,000 in gold for the payment in Chile of export duties. Incredibly the permission was not granted. Under date of April 17, 1917, H. Parker Willis, then secretary of the Federal Reserve Board, advised the chief of the Bureau of Markets that the Board

believed it would not be warranted in granting an application for the exportation of the gold.

Governments have ideas of their own about how business should be done in their behalf. For instance, after arrangements were made for placing appropriate marine insurance on all agricultural nitrate cargoes, it was found that technical reasons existed producing inability to pay premiums on such insurance. One cargo of nitrate of about 5,700 tons went ashore off the coast of Cuba. The cargo was so badly damaged that it represented an almost complete loss. The uninsured loss was nearly half a million dollars. Fortunately for the Department of Agriculture, the War Department had not yet accomplished its formal release of the cargo, so the loss was not chargeable to the nitrate section of the Bureau of Markets.

During the fiscal year 1918 about 75,000 farmers submitted applications for quantities ranging from one-tenth of a ton to more than 100 tons of nitrate of soda. The total quantity ordered was 120,000 tons, but only 75,000 tons were actually brought in due to shortage of shipping.

As time was so short and no special machinery of distribution could be set up for the purpose of insuring a quick and equitable distribution, the Federal supervisor of nitrate distribution utilized the county-agent system of the Extension Service which was just then developing at its greatest rate. Bradford Knapp, chief, Office of Extension Work in the South, who had succeeded his father, Seaman A. Knapp, a few years before the war, cooperated freely and effectively in the nitrate distribution with the approval of his chief, A. C. True, director of the States Relations Service.

In cooperation with the county agents a county distributor was selected for each county or each group of counties where the amount to be distributed warranted such action. An advisory committee was appointed to assist the county agents. These committees were made up of not less than three prominent and reliable businessmen located in different parts of the county or territory. They gave their services free of charge, and the distributor received only a nominal compensation. Shipments were made on payment of cash or sight draft with bill of lading attached.

In the fiscal year 1919 essentially the same plan of distribution was followed as in 1918. With 120,000 tons purchased during the earlier year and only time to distribute 75,000 tons, about 40,000 tons remained on hand for sale in 1919.

The signing of the armistice and the sudden

termination of the war left in the possession of the War Department a large quantity of nitrate which had been purchased and imported for use in manufacturing munitions. The Department of Agriculture arranged to obtain about 115,000 tons of this nitrate at salvage rates and announced a price of \$81 per short ton f.o.b. shipping point or port. The fact that 40,000 tons, bought at a lower price, were carried over from 1918 enabled the Bureau of Markets to fix a price for the entire quantity of nitrate distributed during the fiscal year 1919 at only a very slight advance over the War Department's salvage price. On the basis of then prevailing prices, nitrate distribution saved the farmers of the country about \$2,000,000 in 1919. Orders were received from 100,000 farmers by county agents and the committees appointed to assist them. Shipments were made to the county nitrate distributors on "order notify" bills of lading with sight drafts attached. The county distributors collected from farmers purchasing the nitrate and also distributed the nitrate on arrival.

Distribution to farmers was made in 38 States from 21 storage points. All applicants received their full quota, and practically all shipments went forward in ample time to be used during the fertilizer season. On June 30, 1919, there remained on hand less than 1,800 short tons of nitrate for which applications had not been received. Under the Department of Agriculture's agreement of purchase, this surplus was returned to the War Department.

The Department of Agriculture carried on the nitrate purchase and distribution activity solely as a war measure. When the war powers expired, it ceased absolutely to conduct any such activities. From the close of the war in 1918 until 1923, there was constant agitation that the Department resume its activities in this line. Large appropriations were proposed for the purpose. Gilbert N. Haugen, then chairman of the Committee on Agriculture of the House of Representatives, consulted with Brand who in the meantime, after three years of work in private industry, had returned temporarily to the Department as consulting specialist in marketing to Henry C. Wallace, then Secretary of Agriculture, as to the wisdom of the Government's engaging again in nitrate purchase and distribution. Haugen was gravely doubtful about the wisdom of the Government's invading the field of private industry, as was Brand who had just returned from an extended trip to study the Chilean nitrate of soda situation in Europe. The

result was that although his committee made a favorable recommendation concerning the legislation then proposed (67th Congress, 4th Session, *Senate Joint Resolution 265*). Haugen did not press for its passage, and it was never adopted.

No account of the work relating to the distribution and sale of nitrate of soda would be complete without reference to the very helpful work done by the Office of the Solicitor of the Department of Agriculture in giving legal guidance to every activity that was undertaken. In consequence of this guidance, no serious hitch was ever encountered; the Department's interests were served; the farmers were provided with nitrate; and the importers and shipping companies received prompt compensation for their services.

During the drafting of the food control and other laws, Francis G. Caffey was the solicitor of the Department of Agriculture. He was later appointed district attorney for the Southern District of New York and is now United States District Judge for the Southern District of New York. Judge Caffey is not only a jurist of eminent ability but a deep student of American institutions and American business law. It is of interest to note that he wrote the 600-page opinion in the aluminum antitrust case which was decided in 1942.

Late in 1917 Caffey was succeeded by William M. Williams of Montgomery, Alabama. Subsequently Williams was made Commissioner of Internal Revenue and served to the end of President Wilson's term. Thereupon he organized in Washington the law firm of Williams, Myers and Quiggle which served as general counsel for the National Fertilizer Association for many years and at the present time. Associated with both Caffey and Williams were Edmund B. Quiggle and Chester Morrill, attorneys in the Office of the Solicitor. They did a tremendous amount of work in all of the legal phases involving industry during the war. At present Morrill is secretary of the Board of Governors of the Federal Reserve System.

FERTILIZER CONTROL IN WORLD WAR I

Although fertilizers had not achieved the importance in 1914 that they have achieved in 1944, world shortage of foodstuffs, due in part to shortages of important plant foods, produced a demand for governmental fertilizer control which could not well be denied.

The United States has always been independent of the rest of the world as far as supplies of phosphate rock are concerned. During World War I

the United States was completely dependent upon Germany for potash, and that condition prevailed very largely until about 1930. It is true that in 1915 about 1,000 tons of K₂O were produced in the United States, but very little of it was used as fertilizer. Potash hunger stalked through the crop lands of the United States. Her supply of nitrogen for mixed fertilizer depended largely upon sulphate of ammonia from byproduct coke ovens, while nitrate of soda for top and side dressing came from the Chilean pampas.

In the brief space of two years between 1914 and 1916, fertilizer consumption fell from approximately 7,000,000 tons to about 5,000,000 tons, due to acute shortages of nitrogen and potash. It was conditions that arose from this situation that brought about the demand for the Federal licensing of producers and dealers in fertilizers and fertilizer ingredients. On February 25, 1918, President Wilson on the recommendation of Secretary Houston, with the approval of the Food Administrator, Herbert Hoover, issued a proclamation under the Food Control Act, empowering the Secretary of Agriculture to exercise the control that was deemed necessary.

William Wallace Mein, a California mining engineer then located in New York, was appointed assistant to the Secretary of Agriculture to carry out the duties required under the President's proclamation. He was assisted by an advisory committee composed of Frederick W. Brown, then connected with the Bureau of Soils, later the executive officer of the first potash trade association in the United States and presently an important official of the Civil Service Commission, exercising supervision over the selection and appointment of scientific and technical personnel throughout the Federal service; Karl F. Kellerman, a distinguished plant physiologist in the Bureau of Plant Industry and later associate chief of that Bureau; Carl L. Alsberg, who in 1912 had succeeded Harvey W. Wiley as chief of the Bureau of Chemistry; Charles W. Merrill, representing the Food Administration; Alonzo E. Taylor, well-known food chemist, representing the War Trade Board; and L. L. Summers of the War Industries Board. Dr. Milton Whitney, chief of the Bureau of Soils, served as an advisor to Secretary Houston in connection with the Office of Fertilizer Control.

The Office of Fertilizer Control was divided into four principal subdivisions: administration and regulation; fertilizer production; fertilizer distribution; and transportation. As is chronically true

of government employment in war periods, it was difficult to find a competent staff to handle the necessary work.

Federal licensing was begun immediately after President Wilson's proclamation was issued. Fertilizer manufacturers of the country cooperated, greatly facilitating the work of the office. At the peak of its work, Fertilizer Control had approximately 3,000 firms under license. Among other things, close cooperation was practiced with the car service section of the United States Railroad Administration; agreement was reached between the office and the fertilizer industry whereby licensees agreed to charge the same price for lots of not less than 30 tons in a carload, whether sales were made to dealers or consumers.

The supplies of superphosphate were adequate because supplies of sulphuric acid were sufficient to produce the quantity of fertilizer phosphoric acid (P_2O_5) that was needed.

The deficiency in nitrogen, due to difficulty in obtaining transportation for nitrate of soda from Chile, was overcome to a considerable extent by a rapid increase in the installation of byproduct coke ovens for the production of ammonium sulphate. During the war period the increase in output of sulphate was something like 50 percent.

The normal requirement for potash in the immediate prewar period was about 240,000 tons. The estimated supply for 1918 was only 60,000 tons. It was not until 1918 that the brine of Searles Lake in California produced sufficient potash to begin to be of importance. An excess of boron present in the potash produced at that time occasioned a difficult agronomic problem, later completely overcome.

The attitude of the Fertilizer Control Office on prices was to allow supply and demand to control without official interference. That this policy was reasonably justified is shown by the fact that while prices of mixed fertilizers increased materially they did not as a rule greatly exceed the increase in the level of prices of other commodities. Individual cases of unfair pricing and profiteering were disposed of each on its own merits.

The work of the Fertilizer Control Office diminished greatly with the signing of the armistice and was completely discontinued as of December 31, 1918. Certain phases of the work were placed in charge of the Bureau of Soils and became a part of its regular duties.

In the spring fertilizer season of 1919 complaints were received by the Department of Agriculture of

excessively high prices of fertilizer in many parts of the country. The Bureau of Soils in cooperation with the States Relations Service, conducted an investigation that substantiated the complaints as to many parts of the country. Striking inconsistencies between the quotations of dealers in adjacent counties and even in different parts of the same county were also found. The Department published a series of circulars that was effective in tending to equalize prices.

EXPANDED RESEARCH IN SOIL FERTILITY AND FERTILIZER PROBLEMS

Almost from its beginning, the United States Department of Agriculture has made studies to find means for improving unproductive soils and adding to the productivity of good soils. It has studied the effect of fertilizers and soil amendments, the importance of the organic constituents of the soil, and all of the problems involved in soil conservation and the maintenance of soil fertility.

World War I, with the increased appropriations provided by the Food Production Act, afforded an opportunity to expand these lines of work in the Bureau of Plant Industry under William A. Taylor. Soil fertility investigations were in charge of Oswald Schreiner. He had the assistance of numerous trained scientists, among whom B. E. Brown, J. L. Skinner, and W. W. Garner stood out.

In the Bureau of Soils, under the direction of Whitney, investigations of fertilizer resources were supervised by Frederick W. Brown who was mentioned above in connection with the Fertilizer Control Office. Brown was in general charge of all of the work. In the investigations and demonstrations relating to the extraction of potash salts from seaweeds, his chief assistant was J. W. Turrentine, now president of the American Potash Institute. A separate project dealing with the production of potash from feldspar and other mineral sources, begun in 1912 and including preliminary work on the extraction of potash from Salt Lake brine, was conducted by W. H. Ross and A. R. Merz. Both of these men are still doing valuable service in the Government, and in 1944 Ross was elected president of the Association of Official Agricultural Chemists. With the assistance of W. H. Wagaman and others, Ross also supervised the work on the extraction of phosphoric acid from natural phosphate which has borne much fruit and which antedated the activities of Tennessee Valley Authority at Muscle Shoals by more than 20 years. The Bureau's work on the fixation of

atmospheric nitrogen was begun in 1913. Shortly after that, an experimental electric furnace with absorption towers was installed at Arlington Farm for the purpose of volatilizing phosphoric acid and fixing nitrogen in a single operation. Ross had charge of this work.

In 1916 the Bureau of Soils began its study of the fixation of nitrogen by catalytic processes. This work contributed to the ultimate organization of the Fixed Nitrogen Research Laboratory. In 1913 the Bureau also inaugurated its work to determine the amount and value of city and trade wastes as sources of commercial fertilizer materials.

FERTILIZER ACTIVITIES OF THE STATES RELATIONS SERVICE

The Smith-Lever Agricultural Extension Act became law by signature of President Wilson on May 8, 1914, several months before World War I erupted in Europe. Senator Hoke Smith of Georgia and Representative Lever of South Carolina sponsored the legislation drafted by the Department of Agriculture and meeting most of the views of the agricultural college and experiment station authorities of the various States. The act actually became effective on July 1, 1914. Under other authority and appropriations cooperative demonstration work was already being conducted in 15 States, with 1,151 employees engaged. Practically all of these were located in the South. In 20 other States 113 county agents had already been employed through the Office of Farm Management of the Bureau of Plant Industry. The Smith-Lever Act combined all of these activities and provided an appropriation of \$9,100,000 to be allotted to the States, payable over a period of 9 years. The farmers' cooperative demonstration work in the North and West was under the direction of C. B. Smith, and in the South under Bradford Knapp. Both of these men and their superior officers, including A. C. True and E. W. Allen, director of the Office of Experiment Stations in the States Relations Service, cooperated heartily in all of the work that related to the fertilizer industry.

Much of the work involved in obtaining the orders for nitrate of soda for the Bureau of Markets, in selecting the local committees, and in planning the ultimate distribution of nitrate by the county nitrate distributors was supervised by the county agents. In 1919 alone the county agents gave specific advice to nearly 224,000 farmers regarding the use of fertilizer and conducted 11,665 specific

demonstrations. They also induced 2,156 communities or organizations of farmers to purchase fertilizer cooperatively. The reported value of the fertilizer so purchased was \$3,630,000, and it was estimated that a saving of over \$532,000 was effected. Exclusive of nitrate of soda, more than 64,000 tons of fertilizer and lime were involved in the purchases in which county agents assisted.

ORGANIZATION OF THE FIXED NITROGEN RESEARCH LABORATORY

Although the authority for the establishment of the Fixed Nitrogen Research Laboratory was contained in the National Defense Act of June 3, 1916, it was not actually created until March 29, 1919, when Secretary of War Newton D. Baker issued his order for the purpose of continuing the various researches on nitrogen fixation initiated during the period of actual war. Section 124 of the National Defense Act entitled "Nitrate Supply" specifically authorized the President to "cause to be made, such investigation as in his judgment is necessary to determine the best, cheapest, and most available means for the production of nitrates and other products for munitions of war and useful in the manufacture of fertilizers and other useful products . . .".

The laboratory had as a background not only the research work that had been conducted in Norway, Germany, and other countries, but that done by private interests in the United States and by the Bureau of Soils which has already been mentioned. Throughout the period of World War I the Bureau of Soils cooperated with the Nitrate Division of the Ordnance Department of the Army, rendering a very great service. When the Fixed Nitrogen Research Laboratory was established similar cooperation was extended to it. In fact, its staff and facilities were used heavily. R. O. E. Davis, now assistant chief of Soils and Fertilizer Investigations in the Bureau of Plant Industry, Soils, and Agricultural Engineering, was then one of the chief research men in the fertilizer nitrogen field. J. B. Carothers also assisted ably in this early work.

After operating under the Nitrate Division of the War Department from March 1919 until July 1, 1921, the laboratory was transferred to the Department of Agriculture by executive order. On July 1, 1926, it was made an integral part of the Bureau of Soils. When the Bureau of Chemistry and Soils was created on July 1, 1927, the laboratory was placed in the Fertilizer and Fixed

Nitrogen Investigations Branch of the new bureau. There the work remained with some administrative adjustments until it was taken up by the Tennessee Valley Authority in 1934.

Prior to the creation of the laboratory the Department of the Interior tendered the services of the chief chemist of the Bureau of Mines, Charles L. Parsons, to the War Department for a study of the nitrogen supply and process problems abroad. Parsons, who since 1907 had been secretary and since 1930 has been secretary and business manager of the American Chemical Society, was appointed among others to the Nitrate Supply Committee, later known as the Nitrate Commission. During 1917 Parsons made two reports with recommendations that helped to advance the whole direct synthesis program.

The first director of the Fixed Nitrogen Research Laboratory was A. B. Lamb, now of Harvard University. He was followed by Richard P. Tolman and F. G. Cottrell. J. M. Braham, Frank A. Ernst, and P. E. Howard were early workers under these leaders, Braham, particularly, after the careful consideration that had been given to the arc, cyanamide, cyanide, and nitride processes, felt that the direct synthetic ammonia process was the one that offered the greatest opportunity for future development. This confirmed earlier European experience.

In conformity with the conclusions of the United States Fixed Nitrogen Commission and of other researchers working in the field, chief attention was concentrated on the direct synthesis process, with a full study of the catalyst problem of the production and purification of hydrogen-nitrogen mixtures, and of the development of apparatus that would stand the unusually high pressures and temperatures used.

The principal results of the investigations made by the laboratory prior to its transfer to the United States Department of Agriculture were published in some 76 technical reports of the Office of the Chief of Ordnance of the Army. A published report entitled "Fixation and Utilization of Nitrogen," prepared by the Nitrate Division under the direction of Major General C. C. Williams, Chief of Ordnance, gives the main accomplishments of the laboratory to November 1921. Many years later (1933-1934) during the period of the National Recovery Administration, General Williams supervised the operation of the code of fair competition of the fertilizer industry. The present writer served as executive director of the fertilizer re-

covery committee, the legally constituted code authority for the industry.

On the date of transfer to the Department of Agriculture the total personnel of the laboratory was 108, exclusive of a considerable staff of consulting chemists and engineers. The appropriation for the fiscal year 1922 was \$250,000.

The work of the laboratory was continued actively in the Department of Agriculture for a period of years, although its identity as a separate division was lost. When appropriations were cut at the beginning of the Great Depression, only a few activities that were regarded as essential were provided for. This situation continued until, under the Tennessee Valley Authority Act, that body took up the work and expanded it gradually to its present widespread form.

Title to the Muscle Shoals plants in Alabama had continued in the War Department. They were transferred directly from the War Department to the Tennessee Valley Authority about 1934 by Colonel Lewis Sidney Morey, then finance officer for the Fourth Corps Area of the Army with headquarters in Atlanta, Georgia.

A few concluding comments are in order regarding governmental activities related to chemical fertilizers. Private enterprise was not idle and was primarily responsible for the discoveries that led to the development of the production of potash at Searles Lake and at Carlsbad, New Mexico. In the calendar year 1945 it is estimated that the total production of potash salts will be approximately 825,000 tons. The average use prior to World War I was about 240,000 tons. Then the United States was completely dependent upon Germany; now it is completely independent of the rest of the world. As to phosphoric acid in the form of superphosphate, both normal and concentrated, the United States has been a leader since the early 1870s. Its phosphate deposits, sufficient to last from 3,000 to 5,000 years at any conceivable rate of consumption, are among the largest and richest in the world. As to nitrogen, the United States has had the advantage of the progress that has been made by the byproduct nitrogen industry through the installation of byproduct coke ovens, through the perfection of the processes of recovery, and through the extension of research in many other directions. The fixed nitrogen process on a commercial scale began in Germany and has spread to all countries. Nitrogen is a truly international commodity and will present one of the grave trade problems in the period at the close of World War II.

FEDERAL AID TO AGRICULTURE SINCE WORLD WAR I

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Since World War I the relation of the Federal Government to agriculture has altered in the direction of increasing agricultural aid.¹ This expansion in agricultural aid is at times measured by the mere increase in the number and size of special agencies created to administer laws enacted in behalf of agriculture. Another measure often used is the increase in Federal expenditures to carry on agricultural programs. By whatever device Federal aid to agriculture may be measured, it is clear that it has become increasingly important during the last quarter century.

This paper describes and interprets in broad outline some of the main lines of development in the field of Federal aid to agriculture during the last 25 years. At the outset attention is directed to the development of the philosophy of agricultural aid as a means for understanding the continuity which exists in agricultural programs.

THE PHILOSOPHY OF AGRICULTURAL AID

The philosophy of agricultural aid has long had two continuing threads: Emphasis on the national importance of agriculture as an industry and of farming as a way of life and emphasis on the handicaps, both physical and financial, under which agriculture operates. The first, sometimes called "agricultural fundamentalism,"² has been manifested in many forms—emphasis on the basic importance of farm products for our actual existence, emphasis on the stabilizing influence of agriculture and rural life in our political and social structure, and a sentimental attachment to rural

¹ This article is adapted from a paper presented at the joint meeting of the Agricultural History Society and the American Historical Association at Chicago on Dec. 28, 1944. It is an outgrowth of a research project in the Bureau of Agricultural Economics on which the authors are engaged.

² See Joseph S. Davis, *On Agricultural Policy, 1926-1938*, 24-43 (Stanford University, Calif., 1939), where the doctrine of the basic importance of agriculture is explained and appraised for its elements of truth and error. Compare also the chapter by Edwin G. Nourse on "Agriculture" in *Government and Economic Life*, 2:864-947 (Washington, 1940).

life. Farming has long been considered by many as having distinct social values as a way of life. The thread in the philosophy of agricultural aid which stresses agricultural handicaps has also been expressed in a number of ways—farmer support for measures to reduce interest rates and railway rates, criticism of both middleman profits and organized speculation in farm products, and various complaints to the effect that the farmer bears the burden of unfavorable weather conditions and fluctuations in farm prices, both of which are beyond his control. These two doctrines of the national importance of agriculture and the handicaps under which farmers operate have long provided the basis for movements to obtain Federal aid for agriculture.

In the 1930s, agricultural fundamentalism took on new aspects. Much greater emphasis was placed on the point that a "sick" agriculture impairs the health of the entire economy. And conversely, it was maintained that the economy as a whole receives beneficial stimulating effects as a result of placing additional purchasing power in the hands of farmers. A prosperous agriculture came to be of peculiar national importance because of its added ability to buy the products of other sectors of the economy.

Emphasis shifted also with respect to the disadvantaged position of agriculture and rural people. Thinking as to the handicaps under which farmers operate came to be focused more in terms of overall comparisons between the rural and other parts of the economy—"parity" prices and "parity" income—and less in terms of specific prices paid and received by farmers.

Another important and relatively new development during the 1930s was the greatly increased emphasis given to broad social problems of significance both to rural and urban groups. Improving the lot of low-income farm families, for example, came to be one focal point around which developed a body of doctrine and certain elements of a creed. Similarly, conservation of agricultural resources was elevated to a major position in the philosophy of agricultural aid. In the late 1930s, increased emphasis was placed on improved nutrition and

diets for low-income groups in the urban population as part of the philosophy of subsidized demand for agricultural products.

So long as Federal action of the 1920s in behalf of agriculture was directed mainly toward creating a more favorable economic environment in which agriculture could operate, Federal assistance could be rationalized within traditional body of thought regarding governmental implementation and promotion of economic development. But since 1930 the aids employed were to a considerable extent departures from those of the past, and each had to have its own separate "economic justification." As would be expected under the circumstances, the philosophy of Federal aid to agriculture in the 1930s contained liberal sprinklings of missionary zeal for particular Federal aid programs as well as much real pioneering in economic thought regarding the functions of government in relation to agriculture and rural people.

Anyone who reads the literature of the 1930s in this field will be disappointed, therefore, if he expects to find as closely knit a body of thought as had evolved in connection with much of the pre-depression aid to agriculture. In some respects the great depression gave additional unity to the philosophy of the 1930s, but in other respects the philosophy of Federal aid became more segmental. One explanation may be found in the fact that many of the new aid measures were attached to long-established fields of public action. As a result these new Federal activities often were rationalized in terms of concepts better suited to the older types of governmental action than to those of the depression years. Attempts to rationalize new forms of governmental action in terms of the older concepts often produced separate bodies of thought that were less consistent than the aid programs which they purported to rationalize.

WHAT IS INCLUDED IN FEDERAL AID?

Because of the varied interpretations which are often given to the term "Federal aid to agriculture," it may be helpful to indicate the sense in which this term is used in this article. In the broadest possible sense, Federal aid to agriculture might be said to include all activities of the Federal Government that are beneficial in one way or another to agriculture or rural people. Such a concept is too broad for most analytical purposes; it would include most of the regular functions of the Federal Government. A somewhat narrower concept would include all activities that can be

regarded as "special treatment" of agriculture. This, however, would also include many activities that are not usually regarded as Federal aid, as, for example, regulatory action taken to make the railway-rate structure or the marketing system more favorable for particular agricultural groups. At the other extreme is the rather narrow fiscal concept which identifies Federal aid with Federal "subsidy." This narrow subsidy concept appears to be too restricted for the purposes of this article, for it implies a fairly direct transfer of funds from the Treasury to particular individuals or business firms.

The term Federal aid as used here is intended to cover only certain aspects of the broader field of special treatment. The principal element in such a concept is special treatment of agriculture associated with the *spending power* of the Federal Government. Aid is interpreted to mean special *governmental services* and *money grants* provided by the Federal Government through its power to disburse public funds plus any unusually favorable *enterprise services* made available to agriculture under Federal financial sponsorship or directly through Federal agencies operating on capital furnished by the Federal Government.³

FEDERAL AIDS FROM WORLD WAR I TO THE DEPRESSION OF THE 1930S

Prior to the depression of the 1930s, Federal aids to agriculture did not differ greatly from those provided for many other industrial groups. For the most part the Federal Government confined agricultural assistance to activities designed to create an economic environment in which agriculture could better help itself. Research and educational activities and certain special services relating to the physical side of agricultural production were begun before the Civil War. In the 1920s emphasis was given to research and educational work on the economics of agriculture, including the marketing of farm products. The expansion of extension activities and the develop-

³ For convenience the aids that stem from the furnishing of governmental services and direct and indirect grants at public expense can be referred to as *subsidy aids*. Those that stem mainly from Federal activities of a business enterprise nature can be referred to as *enterprise aids*. The benefits received by individuals may be designated as *subsidy benefits* and *enterprise benefits* respectively. A principal distinction lies in the fact that the former kind of aid gives rise to a net cost to the Treasury, whereas the latter does not.

ment of "outlook" work early in the 1920s are examples. All such educational and advisory activities and special services were designed to provide farmers—and others who furnished services to farmers—with better information as to how to conduct their businesses.

In addition to the general educational, advisory, and special services, the Federal Government promoted and gave limited financial support to certain types of business services which were expected to prove advantageous to farmers. Farmer-owned cooperatives were promoted in an attempt to improve the form of business organization serving agriculture, and special credit facilities to finance cooperatives were provided through the federally sponsored intermediate credit banks. The federally sponsored Farm Loan System, designed to provide farmers with better mortgage-credit facilities, was given limited financial support as well as general supervision and over-all managerial services.

It would be inaccurate to omit from this account some of the aids of this period which represented fairly direct participation of the Federal Government in the provision of what may be regarded as favorable quasi-business services for agriculture. Absorption of interest costs and liberal repayment provisions for farmers in connection with irrigation projects date back well before World War I. Also, beginning in 1918, emergency crop and feed loans were made from public funds. These emergency loans often represented a combination of public lending with a measure of direct relief.

More important than previous aids from the standpoint of direct financial participation by the Federal Government were the price-supporting activities carried on by the Federal Farm Board beginning in 1929. Prior to that time the Federal Government had promoted privately owned cooperatives as a form of business organization suited to the more orderly marketing of farm products, but with the Federal Farm Board a revolving fund of \$500,000,000 was established to finance purchases of farm products. The program was designed to perform a distinct kind of marketing function, and extensive purchases from the fund were made in an effort to prevent a precipitous decline of prices in the early years of the depression. The Federal Government engaged directly in a business venture which was essentially a speculation in certain farm products in the interest of producers of those products. The fact that the ultimate cost to the Treasury was high is some-

times taken to indicate that the Farm Board's activities represented an outright public subsidy. But if the 1930 depression had been short-lived, as many thought it would be, the holding operations of the Farm Board might have involved very little cost to the Treasury and thus would have represented a successful governmental enterprise operation.⁴

Federal aids for agriculture in the 1920s, therefore, represented to a limited extent only an avowed policy of subsidizing agriculture. It is true that costs were incurred by the Treasury as a result of the several types of Federal agricultural activities, but most of the services rendered had become so well accepted that their cost was no longer regarded as an agricultural subsidy. However, the relationship between the costs to the Treasury and the benefits received by particular agricultural groups were somewhat more direct than are the relationships of general costs of government to benefits received by the general public, so that the concept of "Federal aid to agriculture" as used in this article seems appropriate for this period.

DEPRESSION AIDS OF THE 1930S

General characteristics: Most of the new Federal measures taken after 1930 to aid agriculture dealt more directly with the heart of the economic processes that affect agricultural welfare than did

⁴ Some students of the operation of the Federal Farm Board maintain that the costs to the Treasury were high and the benefits for farmers small partly because the speculation was not continued over a long enough period. From this viewpoint the cost to the Treasury failed to result in maximum benefits for farmers because the positive subsidy contributions were counterbalanced by negative enterprise contributions of the aid arrangement as a whole.

From another point of view, benefits to farmers were small because the losses sustained by the Federal Government represented the absorption of losses which would have been suffered by private dealers in farm products. In this sense, the Federal Government bailed out the private dealers. If, however, it is argued that dealers would not have suffered losses but farm product prices would have been still lower, this is tantamount to recognizing a special benefit to farmers in the form of sustained farm prices balanced by losses to the Federal Government. The truth probably lies somewhere between these two views: Farmers probably did enjoy somewhat higher prices than otherwise would have been the case and dealers probably suffered smaller losses.

Board's aids of the 1920s. In the 1930s aid was associated with direct action to control production, to raise farm prices, to make credit available on favorable terms, and to supplement farmers' cash income and with many other aspects of agriculture and rural life that usually are the byproducts of automatic economic forces." Whereas earlier aids operated largely at the periphery of a more or less automatic economic system, those of the 1930s often involved the merging of governmental action with the economic forces operating through the market.

It would be far from the truth, however, to say that aids to agriculture in the 1930s *supplanted* the law of supply and demand. Direct action involving public expenditures was employed extensively to influence both supply and demand, and direct grants were made to supplement the income derived from the market. It is this more extensive "interference" with the automatic forces of the market, rather than a substitution of governmental fiat for "economic law," that characterized most of the aids of this period.

Major types of aid: Agricultural aids of the 1930s can be classified in many ways. For the purpose of describing the changing relations of government to the rural economy, a classification based primarily on the aspects of the rural economy or of rural life through which aid was introduced is useful. Such a classification permits somewhat the same kind of analysis as that which is frequently followed in the study of taxation. Just as it is helpful to classify taxes according to the particular aspect of the economic process to which they relate, so also an analysis of aids, which are in some respects taxes in reverse, can be made along similar lines. Within the limits of this article, it is necessary to confine attention to a general description of the Federal aid "handles" utilized in the 1930s without going into their analysis and appraisal.

Aids in the form of research and educational activities such as had been prominent in the 1920s continued during the 1930s, although both the scope and character of these activities were influenced by the shifts in emphasis in agricultural policy as a whole. The scope of these activities increased as additional funds were made available to provide employment for research workers in both urban and rural areas. Expansion of some of these general services fitted in well with major agricultural programs, as, for example, the purchase and destruction of diseased cattle when livestock

prices were depressed. In other instances, these aids became somewhat less in the nature of direct educational and advisory services and somewhat more in the nature of adjunct-service activities contributing indirectly to the administration of major agricultural "action" programs of the period. This was a noteworthy development in the extension service activities of the United States Department of Agriculture.

Conservation of land resources, an already well-established sphere of Federal action, was a second focal point for agricultural aid in the 1930s. Conservation provided a basis both for expenditures to give rural employment and for grants of money and materials to farmers to promote conservation practices on their own farms. Aside from the important fact that conservation expenditures provided additional rural employment in the depression period, such expenditures may be viewed as the promotion in rural areas of a particular kind of capital formation believed to be in the public interest. From another viewpoint, this capital formation process was the aspect of agriculture and rural life with which special Federal aid for rural people was associated. Opinions differ as to whether the Nation as a whole received enough general benefits in the form of conservation alone to justify the expenditures. This question need not be argued here. The main point is that from the viewpoint of Federal aid to agriculture the Federal Government utilized this long-established field of public policy as one avenue through which special aid was extended to agriculture and rural people.

A third fairly well-established field of agricultural policy with which direct aid to farmers was associated in the 1930s was improvement of rural credit facilities. Special Federal assistance in providing rural credit facilities had already become well established, and the existing institutional arrangements were available for use in the depression years. The Federal land banks were shored up financially and otherwise "retooled" to refinance farmers' mortgage debts and to fund their other obligations; an adjunct Federal mortgage credit institution, the Federal Farm Mortgage Corporation, was established; special credit facilities were provided for operating credit; and other special-purpose credit facilities were provided to make loans to low-income farmers. Aids associated with farm credit were a combination of federally sponsored enterprise services and direct and indirect public subsidies, with the proportions

in which these two elements were combined varying widely among the different agencies. Subsidies were introduced directly in connection with the terms and conditions of loans and indirectly through financial contributions to the lending institutions. Moreover, assistance in the form of advice and supervision was associated with many of the loans to low-income farm families. A substantial part of the aid, however, took the form of emergency business services of a financing nature.⁵

A fourth field of Federal aid introduced in the late thirties was associated with the promotion of crop insurance as a more effective way to deal with physical production risks growing out of variations in crop yields. The Federal Crop Insurance Corporation, a Federal corporation, wrote all-risk yield insurance on wheat and cotton. Federal aid consisted of sponsorship and administration of the insurance program and absorption of losses arising out of the failure of premiums to cover indemnities. In some respects the Federal Government performed the business function of "entrepreneurship." Also it was an experiment to determine whether insurance was feasible as a means for dealing with certain classes of agricultural production risks. In many respects, however, crop insurance represented a new approach to an old problem which had been previously dealt with mainly by means of emergency crop loans and direct grants to farmers and farm families in high-risk production areas.⁶

These four types of agricultural aids dealt

⁵ A tendency in the 1930s to rationalize the new functions performed by the Federal Government in terms of concepts better suited to its previous relations to the rural economy is well illustrated in this field of Federal aid. The concept of Federal sponsorship of improved business enterprise services of a financing nature, which applied to most of the activities of the Federal Government in this field in the 1920s, was inadequate to describe the emergency business services, quasi-central banking services, and the indirect subsidies for farmers provided through special credit institutions and agencies in the 1930s. The activities of special agricultural credit agencies took the form in the 1930s of loan transactions, but the substance often involved much more than business services of a financing nature.

⁶ It was not entirely clear at the time whether costs incurred by the Treasury as a result of this program were to be considered as costs of an alternative method for assisting farmers in dealing with high production risks or as costs arising out of the failure of a federally sponsored insurance arrangement to pay its own way as a business enterprise.

mainly with problems which relate to particular aspects of the agricultural process. None of them dealt so directly with the heart of the economic process as did the aids that took the form of control of production, raising prices through action in connection with the marketing of farm products, and direct cash contributions to farmers' incomes. A major objective of these latter aids was to raise the level of farm income. Measured by cost to the Treasury, aids of this kind have been by far the most important.

The combination of cash grants with production control under the Agricultural Adjustment Administration program represented a new approach to agricultural problems. Previous efforts had been confined mainly to giving advice to farmers regarding production and price prospects in the hope that farmers individually would adjust production to the prospective market situation. The measures taken in the 1930s to control production represented a combination of direct money grants with a degree of federally sponsored over-all management of important segments of the agricultural industry.⁷ After the Hoosac Mills decision by the Supreme Court, the program was modified and associated with a long-established public policy of promoting soil conservation. But, throughout, a central objective was to raise the level of farm income by reducing production and supplementing farmers' incomes with cash grants. These grants increased individual farmers' incomes directly and at the same time provided an incentive for them to cooperate in the program of selective restriction of production.

Another major group of programs also designed to increase farmers' incomes consisted of the several price-raising aids operating through the marketing process. These aids have taken two principal forms: Withholding farm products from the market through commodity loans and direct governmental purchases; and increasing consumption of farm products through various purchaser subsidies.

The immediate effect of withholding farm products from the market is to raise the prices received by farmers. Whether prices are maintained at a higher level than otherwise would prevail depends mainly on supplemental action taken to control production or to increase demand. The price

⁷ F. B. Garver, "Cartels, Combinations and the Public Interest," *Journal of Farm Economics*, 26:617 (November 1944), refers to the AAA as a type of domestic cartel in which the Government becomes the administrator.

particular of them economic of connection in products, incomes, to raise it to the far the production Admin- each to d been regard- hope- unction mea- repre- s with man- cultural l and icy of but, a farm anting grants and them action

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raising activities of the Commodity Credit Corporation resulted in the accumulation of stocks during the latter part of the 1930s, but any subsequent depressing effect of these stocks on prices has been largely obscured in the developments of the war period.

Increasing demand through purchaser subsidies has taken several forms. In the early and middle thirties, "surplus" farm products were distributed in the form of direct relief. Later, low-income families were given food subsidies under the Food Stamp Plan whereby the grant of free food stamps was tied with the purchase of other food stamps. Other arrangements were made to distribute food to needy school children. Of a different nature were subsidies paid to exporters to enable them to pay domestic producers prices higher than competitive world prices for farm products and still sell them in export markets. One purpose of all such arrangements is to increase the total demand for farm products.

Although arrangements to increase the total demand for farm products influence their prices directly, benefits for agriculture and rural people arising from the public expenditures involved are not so direct as are those derived from money grants. Costs incurred by the Treasury under such programs should not be interpreted narrowly as *agricultural* subsidies in the sense that money grants paid to farmers are agricultural subsidies because benefits from programs that increase market demand are distributed among subsidized purchasers and handlers of food products as well as among farmers.

The final major type of Federal aid to agriculture in the 1930s consisted of various kinds of assistance for low-income rural people, provided principally under the Farm Security Administration and its predecessors. One distinguishing characteristic of these aids is the fact that economic status is a principal criterion for public assistance. The farm family itself rather than some impersonal aspect of the economic process as it relates to agriculture is the focal point for the aid. A combination of devices is used—advice, money grants, special services, loans on favorable terms, and a measure of public supervision. In the rural rehabilitation program, both aid and a measure of public control are combined in one administrative process. The willingness of the Federal Government to extend aid makes possible the exercise of a substantial degree of public control over farm and home management practices.

AGRICULTURAL AIDS IN THE WAR PERIOD

The preceding characterization of Federal agricultural aids remains applicable at least until the entry of the United States into World War II, and many of these activities continued in effect during the war period. This is particularly true of the basic research and educational services, conservation services, and agricultural credit aids. There was, however, a change in emphasis both in the payment of direct subsidies to farmers and in connection with the market-price support and production-control activities of the Federal Government. While the concepts of parity price and parity income remained in the foreground of agricultural policy, increased emphasis was placed on support prices and direct subsidies as incentives for increased production of agricultural commodities.

In some respects the attempt to expand agricultural production represented a reversal of the previous policy of limiting production as a means of increasing farm income. Still the war period cannot be characterized as a blanket expansion of farm production, for the acreage of some commodities continued to be reduced. In the main, an effort was made to expand the acreage of selected products which were particularly scarce in the war years and to achieve a better over-all balance in agricultural production in relation to the rest of the wartime economy. By means of commodity loans and direct governmental purchases, it was hoped to maintain the prices of basic commodities at or above 90 percent of parity and of other selected commodities, where greater expansion was required, at prices considerably above parity.

The general provisions for price supports under the Stabilization Act of 1942 are to remain in effect from 2 to 3 years after the end of the war. At the same time, the law appears to regard price supports at 90 percent of parity merely as the minimum of governmental activity, for it is still permissible under the Agricultural Adjustment Act of 1938 to adopt acreage allotments or marketing quotas as a further means of enhancing farm prices. Thus, it is possible to regard agricultural policy in the war period as partially an outgrowth of the policies developed during the 1930s. The main difference is that provisions for production restrictions remain in abeyance since at support prices the wartime demand for most commodities tends to exceed the supply.

**SOME IMPLICATIONS FOR FUTURE TRENDS IN
AGRICULTURAL POLICIES**

Does a review of this field of Federal aid yield any suggestions regarding possible future lines of Federal action on behalf of agriculture? To forecast specific measures when we cannot foresee even the general economic situation a few years hence would be presumptuous. Yet developments in the past do suggest certain basic tendencies that are likely to persist.

One suggestion is that agricultural aid is very likely to be introduced in connection with fairly well-established patterns of public action in relation to agriculture, even though the major objectives of the Federal aid may be either much broader or much narrower than the traditional field of public action with which the aid is associated. For example, aside from any agricultural aid advantages inherent in governmental programs affecting prices received by farmers, the mere fact that such an approach is well established will argue strongly for its use in the future. For much the same reasons the credit mechanism is likely to continue to be an important avenue for Federal aid. Purely from the viewpoint of legislative and administrative considerations, it is often more feasible to attach special aid to an existing field of governmental activity than to develop new approaches. This is especially true when the action is expected to be temporary.

The record of the past also suggests that agricultural aids will continue to emphasize governmental activities that contribute to objectives of more than strictly agricultural interest. Widespread public interest in programs relating to conservation of natural resources, strengthening the national credit structure, stimulating the overall flow of purchasing power, improved diets and nutrition, etc., provided an environment favorable to the development of a number of the agricultural aid programs in the depression years of the 1930s. The postwar years doubtless will bring other

national objectives to the fore, and many of them will also have their agricultural aid counterparts. A greater interest in international problems, for example, may well reflect itself in agricultural aid programs that promise to contribute something to objectives in this sphere.

A third influence that is likely to continue is the tendency to develop agricultural aid programs for which an emotional as distinct from an economic appeal can be made to nonagricultural groups. Farm foreclosures, unsanitary housing, and inadequate nutrition and medical care are conditions that can be dramatized and for which corrective measures are likely to receive widespread support.

The pattern of postwar agricultural aid arrangements thus is not likely to conform very closely to one devised solely in terms of a direct attack on fundamental agricultural problems. It is often necessary to utilize aid arrangements that are partially in conflict. Devising slogans and developing support for measures from groups with diverse and often conflicting interests is peculiarly the function of political leaders and a very vital function in a democracy. Because the democratic process is what it is, special aids for agriculture are very likely to continue to be a patchwork not unlike the modern tax system. Areas of overlapping aids and of "blind spots" are likely to continue. Also, benefits from one kind of agricultural aid may be negated by competitive economic burdens arising from other aids or from action taken with respect to nonagricultural problems. Aids that tend to promote one public objective may be offset by the collateral effects of aids designed to promote another. Getting any action at all often involves compromises that seem, to one who abstracts economic problems out of their political setting, to involve unnecessarily high costs in relation to net returns in terms of social welfare. The social scientist has in this field an excellent opportunity to use his specialized research techniques to throw light on the net effects of such governmental action.

OBSERVATIONS ON SOUTHERN ITALY

T. EUGENE BEATTIE

As the war continues in northern Italy, life in the southern provinces is slowly returning to some semblance of normalcy.¹ To the observer certain

basic facts stand out prominently. Italy is still primarily an agricultural nation with limited re-

¹ This article is based on eleven months' observation while serving with the United States military forces in the provinces of southern Italy. It was mailed to the

author's former professor, Donald L. Kemmerer of the University of Illinois, on Dec. 6, 1944. The author was accidentally drowned in Italy on Jan. 17, 1945. The article has been passed for publication by the censor.—*Editor.*

sources and few raw materials. The southern provinces remain retarded agriculturally despite the ambitious agricultural program of Mussolini. The political bents and concepts are varied and confused, and potential postwar problems, including inflationary dangers, new aspects of demand, and physical and social reconstruction are already discernible.

It will be recalled that Mussolini's assumption of power came at a time when the nation was still being rocked by the industrial, political, and financial tremors following World War I. Debts were high; the lira had fallen in value; prices had soared; there was unrest between peasant and landlord; grain production was low; agriculture was plagued with the traditional extremes of the latifundia on the one hand and the small single-family freeholds and tenancies on the other; and illiteracy was widespread.

The observer in southern Italy today speculates as to whether or not the conditions following World War I were essentially different from the post-war potentials of conditions in the southern provinces today.

AGRICULTURE IN THE SOUTHERN PROVINCES

The statistics from Italy under Fascism tended to give the American student a distorted view of Italian agriculture because they high-lighted the modern aspects of Italian rural areas and toned down the yet-to-be-modernized phases of the problem. Mussolini attempted to solve the problems of agriculture by promising it a position as a modernized national industry, enjoying the benefits of subsidization, reclamation, and education. He promised to overcome low production and even undertook "the Battle of Wheat" as early as 1925 when Italy was importing some 30 percent of her wheat needs. Later, under the designation, "the Battle of Agriculture," the program was pursued on a wider front, so that by 1936, according to Fascist figures, some 70,000,000 acres of land were in agricultural production, and the nation's reliance on wheat imports was down to 2 or 3 percent of total consumption. What current farm conditions might have been had Mussolini's dreams of a modern agricultural system not been aborted by the outcome of his war is pure speculation and outside the province of this article. The fact is that the southern provinces are today a far cry from the Mussolinian dream.

The province of Apulia may be taken as an example. It extends for 225 miles along the

Adriatic coast and inland from 30 to 60 miles. Here marks of the Fascist farm program stand side by side with old-time agriculture. Improved hard-top roads in the Foggia area are dotted on both sides by farms built under the Fascist institution, the Opera Nazionale Combattenti (the O.N.C.); southward toward Molfetta the picturesque water-wheel country stands in sharp contrast.²

A visit to a Foggia bookstore still will uncover agricultural literature of the O.N.C. regime, suggesting that Italian farmers are literates interested in scientific farming. There are, for example, the O.N.C.-edited *Le macchine agricole* with its 478 pages of instruction and illustration on the care, operation, and maintenance of agricultural power machinery. Or, if one is interested in crop culture, there still are remnants of the pamphlet series entitled *Biblioteca di coltura*, with its works on the cultivation of rice, fruit, coffee, and the like. Likewise, portions of the pamphlets called *I libri dell'agricoltore* still are available. The initial impression of progressiveness given by the publications, however, is dispelled and replaced by doubt as one travels through Apulia, Campania, Lucania, and other provinces in the south.

On the main highways of the Manfredonian peninsula and on the highways west and south of Foggia and from Foggia to Cerignola, one sees the standardized Fascist farm with houses similar to the kind referred to as Type 13 in the official O.N.C. book, *L'Agro Pontino*.³ In contrast to the neat and, for Italy, modern buildings on the farms are the retarded methods of cultivation. In the spring fields are tilled by men and women walking behind bovine-powered single-share plows or swinging broad hoes endlessly. When the time for threshing and harvesting comes, power threshing machines and their accompanying separate steam engines may sometimes be seen threshing the principal crop. Hand harvesting and threshing are more common, however, and are almost in-

² Apulia's principal cities and their population are: Foggia, 50,000; Molfetta, 45,000; Bari, 164,000; Taranto, 50,000; Barletta, 50,000; and Cerignola, 36,000.

³ Type 13 is a 2-storyed structure with a stable (*stalla*), storehouse (*maggazzino*), kitchen (*cucina*), porch (*portico*), and hen roost (*pollaio*) on the ground floor and 3 living rooms (*camer*) on the second. The overall length is about 75 feet and the width 37 feet. Such farms often have a cylindrical silo, a draw well, and a baking house. Each covers several acres (sometimes as many as 30 or 40); each has a principal grain crop, a vegetable garden near the house, and a few fruit trees.

variably used for legumes and minor cereal crops. The cutting is done by scythe or sickle and the threshing by flail or the treading of animals on a threshing floor.

Thinking the Fascist farms near Foggia quite good, despite primitive methods, I asked an English-speaking Italian there about the success and popularity of the Fascist agricultural program in that area. This was her reply: "Prior to Fascism each farmer could produce what he wished and sell it wherever he got the best price. Not so under Fascism under which produce—that is, produce such as grain, nuts, legumes, and so on—was given to the State. The State then allowed a yearly grain ration to each family; the allotment was regardless of output. In Italy the poor farmers always have had to get along on little enough grain anyway. Needless to say, the Fascist quota was grossly inadequate and resulted in widespread dissatisfaction."

In the coastal regions south of Cerignola and north of Bari, cereal crops give way to fruits and vegetables. Orchards of olive, almond, and fig trees with small vegetables between the rows and extensive vineyards which in peace time provided part of Italy's exports to France predominate. In this area of Apulia, cultivation also is crude. Wooden water wheels, powered by donkey treadmills, provide irrigation where necessary, and mattocks and hoes serve for cultivation. Here there is a strong attachment of farmers to nearby towns, so that early in the morning and again at dusk long caravans of two-wheeled carts and bicycles congest the hard-topped roads as the farm workers make their way from village homes to and from the fields.

West of the main highways from Foggia to Bari are to be found manorial estates which sometimes cover from 300 to 400 acres. This size is extremely large when one considers that, according to some students, the average pre-war Italian farm was about 2.5 acres. On these estates several families share the centralized living quarters furnished by the landlord. These quarters usually are self-sufficient units with silos or grain pits, stables, a well, a clothes-washing trough, often a bake house, and sometimes a chapel, for common or community use. Such estates, for one reason or another, more often possess "modern" equipment than do other farm establishments in the area. As a matter of fact, it is not uncommon to see American-made machinery of the early 1920 vintage or native equipment manufactured in northern

industrial cities such as Milan. Even where machinery is in use, however, the methods are so far removed from the American concept of "modern" that one asks at times, "Is this modern Italy—the power which assumed the burden of waging modern war?" To watch the "modern" threshing machine, dependent on a fire-pit steam engine for power; to watch grain being brought from the fields to the place of threshing in two-wheeled mule carts; to see grain handled, sacked, and stored away by hand is a bit of a novelty for an American from the Middle West.

Notwithstanding the modern equipment available on most large estates, manual labor still prevails. Here again, men and women wield mattocks and hoes in cultivation, sow by hand, and harvest with scythe or sickle. Throughout the year the landlord or his overseer may be seen making the rounds of the fields. In his breeches and coat, with his riding horse or sulky, he stands apart from the peasants over whom he has jurisdiction. His clothes and manner suggest the class cleavage still prevalent in the provinces of the south, as do the differences between his villa and the living quarters of his underlings.

The roads along the coast are generally good, and even in the more inland areas the narrow country roads are often well gravelled and maintained. Journeys for the natives are slow and laborious, however, for in most rural areas and on the principal highways of the coast the almost universal means of transportation is the mule-drawn two-wheeled cart. Bicycles are in widespread use along the coastal highways, too, but they are not used for "freight."

In the late summer or early fall, a trip from Apulia into Lucania gives a clue to what is to be expected in the hill country closer to the Apennines. Here farm machinery seems to be nonexistent. Grain is threshed by flail on a threshing floor; cultivation is by hoe; and grain is cut, threshed, and milled by hand. Grazing is more widespread than in the coastal regions where pastureland is scarce. Farms are impoverished, and the occupants illiterate and provincial in the extreme. Farms in the hill areas are small, usually single-family units where human beings, cattle, pigs, and fowl often share the same quarters. The extent of landholdings is very small, and one wonders which of the two contestants wins out—the would-be farmer or the land.

Household industries prevail alike in the provincial hill villages and farms and in the larger

cities along the Adriatic coast. Even in the larger cities of Apulia, women and girls can be seen washing, combing, carding, and spinning wool into yarn. Women still winnow grain and mill it into flour for their bread. Boys still operate ropewalks, and men still follow their traditional trades as wheelwrights, shipwrights, shoemakers, and potters. In Lucania, toward the mountains where timber is available, the charcoal industry is carried on both as a household and as a commercial enterprise.

Even to the amateur observer in the southern provinces there is evidence of the diverse interests of the owners of manorial estates and their tenants, of the subsistence problems of the impoverished freeholders, and of the extent of illiteracy and backwardness still prevalent.

Modern Italian leaders already recognize the problems and are taking steps to meet them. The Italian council of ministers has approved a decree designed to ease the burden of tenant farmers. Under the plan, the production of tenant-cultivated land will be divided so that the farmer will get three-fifths of the output and share half of the outside expenses. Where land productivity is above average, the crop allocation is to be made by a regional commission. Provision is made, moreover, for the distribution of land now owned by municipalities, universities, and other public and quasi-public institutions to cooperatives composed of the non-landowning farmers. According to the United Nations News Service, the plan is a temporary one, intended to extend for a year or so after the signing of peace terms with the Allies.⁴

The foregoing decree seems to make no provision for the small farmer who owns his land nor does it seem to make allowance for the fact that the organization of scattered and illiterate non-landowning farmers into cooperatives is no small problem. In this respect, the plan suffers from some of the same shortcomings as the Fascist plan under which national federations of workers and employers were organized into a national agricultural confederation of a semipublic nature under national corporations. It should be noted, too, that the proposal tends to perpetuate existing classes rather than to eliminate them. It is not likely that the lot of the small farmer will be greatly improved under the council's plan.

⁴ *Stars and Stripes* (Mediterranean ed.), Oct. 25, 1944.

MONETARY PROBLEMS

Following the first World War Italy experienced inflation. Already in this war, her monetary system has met at least two strong forces. The first was the worthless money with which the Germans flooded the country. The second was the valuation of Allied military currency at the ratio of 1 lira to 1 cent instead of 1 lira to 5 cents as before the war.

Money quantities in Italy have been swollen by the influx of military currency and by the expenditures of the G.I., whose rate of pay has been much higher than that of most other soldiers in occupied Italy. Suggestive of the magnitude of soldier expenditures, although by no means indisputable, is the statement of a collector that "hundreds of millions of dollars" have already been spent by souvenir-seeking soldiers overseas. This collector has also stated that the principal offenders in the faked art treasure and souvenir racket have been the Germans and the Italians.⁵ His estimate takes no account of legitimate expenditures for supplies, rent, and services.

The flow of money from the pockets of soldiers into the Italian market has put more money in the hands of Italians than they ever had previously. Money prices and money wages have soared. The fact that the purchasing power and money wage increases have been disproportionate (with the bulk of the increases going to shopkeepers and service trades) makes the poor farm laborer and the villager feel more acutely than ever the lack of purchasing power; common laborers in big cities have felt the pinch as well. The recent discontinuance of further issues of Allied military currency in Italy should alleviate the problem somewhat as should the increasing amounts which soldiers are sending home in various forms of savings.

With the peace will arise many money problems. Allied military currency will have to be withdrawn from the market. Native currency will have to be stabilized. Unless supplies and foods now regulated by the Allied control commission are controlled by peacetime agencies and unless manufactured goods flow into the country fast enough to offset the production set-backs caused by the war-time devastation of the industrial regions of northern Italy, there will be strong tendencies for Italians to bid up the prices of available supplies

⁵ *Ibid.*, Oct. 31, 1944.

of goods. This bidding up will be stimulated by the increased quantity of money mentioned above. The competition among Italians with purchasing power also will tend to accelerate the circulation of money within Italy which will, in turn, present an inflationary potential similar to increased money quantities; especially is this likely to be true in the light of production difficulties in the postwar period. In addition, of course, there will be the complicated fiscal problems inherent in Italy's great war indebtedness and limited national resources. If, as provided by international law, Italy is required to pay for the costs of occupation as well as for normal civil functions during the period, the fiscal pattern will be further complicated.

There will be certain safety valves which, if properly applied, should prove useful. One of these might be the reduction of purchasing power through the imposition of heavy taxes to meet Italy's debts and the coming costs of physical reconstruction. Taxes in Italy have always been heavy and a burden on the people, however, and to increase the load indiscriminately would be to place an even heavier financial burden on the "little" man.

A second safety valve could be the sensible withdrawal of Allied military currency from circulation after American troops have withdrawn. This currency withdrawal might be by gradual redemption in cooperation with the Italian banking system. An immediate and total lira-for-lira redemption would enhance inflationary possibilities while outright repudiation would be a serious blow to Italian faith and morale and an overwhelming loss to those whose wartime activity has netted large earnings in exchange for goods and services.

A third post-war safety measure might be the creation of economic controls in the form of regional commissions designed to ration available supplies of goods, to regulate prices and production, to allocate labor, and to negotiate contracts for the reconstruction of native business.

NEW ASPECTS OF DEMAND

During the Allied occupation of southern Italy, a great and unintentional advertising campaign has been carried out which has created new consumer desires among Italians. The flow of American goods into Italian hands as tips and gifts and through the black market has placed a premium on American products. Highly regarded by Italians, even in the provincial hill country, are ciga-

rettes, gum, candy, face soap, and other products. Motor vehicles, airplanes, clothing, tools, and other types of military equipment of American manufacture are highly thought of and respected by the Italians. The popularity of American products in southern Italy may be due either to their superiority or to the unavailability of European products. Evidence suggests that both factors are operative but that the former is the stronger.

In prewar days most southern Italians knew about Americans and about American-made products through limited imports, the tourist trade, textbooks, and movies. Today, in remote areas where in peacetime American movies and products probably never circulated, there are American army camps where movies are shown regularly for the soldiers and where American products are in evidence everywhere. In the areas where Italian soldiers are employed in helping Americans, the Italians may view the movies. In the summer, when movies are shown outdoors, even Italian civilians in some areas may see them from outside camp limits. Increasingly, the Italians are being won over to American goods.

It is impossible to tell how much of the present desire of southern Italians for American goods will remain as permanent demand in the postwar period. It seems reasonable to assume, however, that the advantages of such goods which the Italians already have enjoyed for more than a year will not be forgotten at once. It seems reasonable, moreover, that some of the immediate consumption desires will remain as permanent postwar demand. When American troops leave Italy and when the flow of goods from America is cut off or sharply reduced, the Italians of the southern provinces may continue to expect and demand the import of American products. If this expectation does not occur, then there may at least be a more critical attitude among southern Italians toward products of Italian manufacture now that the natives have been introduced to American standards on a fairly large scale. Consequently, there may be not only new markets for American manufacturers and exporters but also improvements in the standards of Italian production and marketing.

Northern Italy has been pretty well torn up by the war. Many cities have been totally destroyed; power plants have been made inoperative; bridges have been blasted; and factories have been ruined. This means that northern Italy which, in the past, was the country's chief source of domestic manufacturing no longer will be capable of producing in

substantial amounts until after reconstruction. Even the northern plants which may remain intact will be faced with problems of adaptation and reconversion. Naples, which was one of the leading industrial cities in southern Italy before the war, also will require substantial industrial reconstruction and reconversion before consumer goods can be produced in peace time.

The United Nations, and especially the Americas, can expect a call for help from Italy when the task of rebuilding comes. Italian industry will need steel, equipment, tools, supplies, and capital, as well as the assistance of capable engineers. Furthermore, until such time as Italian industry is put back on its feet, Italy either will have to look to the United Nations for most of her manufactured goods or will have to struggle along without them until her own industries are in production again. In either case complicated problems will arise. In the first is involved the problem of importing goods from countries which, themselves, will be faced with problems of reconversion and the meeting of pent-up consumer and industrial demand; in the second, comes the problem of exporting to a nation lacking immediate funds for payment. Loans of money, lend-lease, or both may be a possible solution.

THE POLITICAL SCENE

In the provinces of Apulia, Lucania, and Campania are many political bents and confused concepts. While in cities like Naples, political interests exist and are nurtured by such publications as *La voce*, a socialist and communist organ with a circulation of 70,000, it is safe to say that most of the southern peasants have few, if any, political convictions. They are removed from most normal news channels; they are too busy grubbing a livelihood out of the soil to give serious thought to politics, and they have been so long removed from active political participation that they have few vestiges of political initiative.

Even in the larger cities of Apulia and other provinces, political concepts seem confused. There appears to be a propensity to think of democracy and communism as similar political ideologies and to classify the leaders of the three principal United Nations as proponents of the same systems of liberty. It was a common practice some months ago to paint political slogans and symbols on buildings and walls, but more recently this activity has declined. Citizens of certain cities, moreover, have worn lapel buttons with hammer and sickle and,

in some instances, have engaged in political demonstrations, orderly and well controlled.

Many months ago I asked a teen-age boy in an Adriatic city what sort of political system he favored. He replied that he favored communism, as did his parents. "What do you mean by communism?" I asked. "Why democracy!" he said, "Just like you have in America!"

Some persons maintain that people in the southern provinces lean toward the communistic system because the exigencies of city existence can best be overcome by collective action than otherwise, and some state that the comments for democracy are often expressions of expediency designed to get the favor of soldiers. The combined desire for communism for existence and democracy for expediency, such persons say, may explain why the two political doctrines are linked with each other in the minds of southern Italians.

It is impossible to say how many vestiges of Fascism remain imbedded in the minds of Italians in the south. There is some evidence of Fascist leanings in former strongholds of Fascism, and some natives insist that a strong spirit of Fascism still lies under the surface. Among members of the Italian army one can hear comments in defense of Mussolini, and some regiments still count marching cadence by repetition of the words, "Duce, Fascisti"—a habit formed long ago and one repeated automatically without meaning. If one tries to pick up Fascist souvenirs in Apulia, he may be able to buy coins, buttons, and the like. Let him try to get a Fascist membership card or other paper evidence of Fascist affiliation, however, and he is told that all such material was destroyed at the time Italy signed the armistice with the United Nations. Sometimes one finds expressions among Italians that Mussolini and his party broke faith with their fellow countrymen.

Now and then there come to the surface evidences of tension between the communist party and the socialist party. Much dissension arose between them after World War I, but currently they have a working agreement in occupied Italy. From time to time there has also been dissension between the democratic party which favors monarchism and the republican party which opposes it. After the war, there will have to be some permanent reconciliation among the several existing political parties if civil disorder is to be averted.

In the postwar period also should come a re-education of the youths who have been indoctrinated.

trinated with Fascist beliefs since early childhood. So far as the rural southern provinces are concerned, the populace on farms probably will accept with resignation any political set-up which may evolve. The primary sources of influences are likely to be once more—as in Italy's past—the intellectuals, the landed classes, and the groups which, under Fascism, rose to political and economic power and prestige.

CONCLUSIONS

Prospects for postwar Italy suggest problems similar to those which followed World War I. These problems, while difficult, are not insurmountable although they probably will involve some forms of aid from the United Nations, which today are following a wise policy of hands off on political parties, of aid in meeting civilian economic needs, and of alertness to present and future national problems.

HISTORY AND AGRICULTURAL SCIENCE

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The value of historical research in connection with any particular industry has been constantly questioned.¹ This is partly the result of looking at history as a fiction having little more real relation to our lives than a story or novel and partly the result of imagining that the methods we now adopt are the only possible methods. Why should any interest be taken in methods that have been superseded when it is incredible that we should ever dream of returning to them? How can it benefit us to know such methods or their productive results? The present, however, has its roots in the past, and the relation between the past and the present in agricultural science is as clearly marked as it is in any other. Actually, of course, history is merely a statement of what has happened in the past, recent or remote. It may be the history of yesterday, or it may be the history of old times.

The scientific value of the classical experiments at Rothamsted is universally known and admired, and, in point of fact, these experiments are little more than the story of the system of cropping continuously carried out for a period of years and recorded. Some of the most interesting and valuable of the results are admitted to be due to the long continuance of these experiments, although at their inception no such plan was formulated.² Science in this case is entirely historical. It is a

record of what was done in each year and the effect upon the crop. In the grassland experiments, which have been carried out and recorded at Cockle Park since 1897, and which have resulted in the discovery of the best manures for grass to be used in characteristic soils in the county of Northumberland, the scientific knowledge was obtained from the story of the work and its results.

Agricultural development in England, as in continental countries, is inextricably bound up with the system of land tenure. Until the enclosures had taken place, it was not possible to apply to agriculture the slight but increasing measure of scientific knowledge that was obtained in the seventeenth and eighteenth centuries. It was only in those districts where large farms held in severalty had become commonplace that people were able to introduce the new crop rotation, to use artificial grass, and to cultivate roots. Upon the smaller and mixed holdings in the common fields traditional implements were used, and the traditional rotation was followed because the pace of development was necessarily that of the slowest and most backward member of the community.

The enthusiasm for agriculture which marked the eighteenth century in England culminated in the enclosure movement at its end. The movement was instigated by men who were anxious to utilize the new knowledge and who could not adopt it on farms split up into small sections distributed in the common fields. Their efforts would have been negatived by the bad cultivation of their neighbors. The work of enclosure, which had been going on slowly, was greatly accelerated, and the possession of the new holdings in severalty necessarily per-

¹ This article appears with the same title in *Science Progress*, 19:504-506 (January 1925). It is here printed with the permission of the author.—Editor.

² See Sir E. John Russell, "Rothamsted and Its Experiment Station," *Agricultural History*, 16:161-183 (October 1942).

mitted experiments to be carried out which the Continent was incapable of attempting, merely because their own system of land tenure did not undergo any such complete, concentrated, and speedy amendment.

In this connection the distinction between the agriculture of northern and southern France is interesting. In the south of France, which, in their day, was occupied by the Romans, the open field method of cultivation was not used in the same way as it was in the more Teutonic north, where the holdings were the characteristic distributed acre strips of the common field system. In the south holdings were set out on the more classical rectangular lines, and artificial grasses, such as lucerne, which were known to the classical agriculturists, continued to be cultivated. In the north, where the open-field system was till very recent times practically universal, artificial grasses were not cultivated, the ordinary three-field or two-field systems of rotation being used. The characteristic implements of the two districts also differed very much. But Arthur Young had found, in 1794, to his astonishment, that the enclosures of the south had not inspired improvement. The rotations employed were traditional, and the improved rotations, that were the consequence of the introduction of the turnip and the artificial grasses from Flanders, combined with the enclosures in England, were only passed on to France in the middle of the nineteenth century. The new system might not have become serviceable even then had it not been for the modifications in tenure introduced by the Revolution, not the least important of which was the permission granted to every proprietor to cultivate as he pleased.

In the polders, reclaimed from the sea, the most important consequence of enclosure, in Young's eyes, was the fact that the "complete control of the individual cultivator over the course of cultivation had existed for centuries." These conditions were to be found about the beginning of the nineteenth century along the Rhine through Netherlands and in some provinces of Germany, and it is worthy of remark that it was from this district of unrestricted cultivation that many of the improvements were introduced into England during the late seventeenth and eighteenth centuries.

Again, in eastern Prussia, the Junkers had, since the sixteenth century, held a large proportion of the land in their own occupation and had been consistently adding to the extent of their possessions as opportunity provided, so that by the early years of the nineteenth century they were

capitalist farmers of their own land and were of a type quite different from the landowners of England or the great nobles of France. During the first thirty years of the century, the habit of farming their own land became consolidated, and, although the practice of leasing farms was not unknown in the eighteenth century, large farms, worked by their proprietors, were, and still are, a consequence of this movement in the early nineteenth century. The Junkers were enthusiastic agriculturists, and they learned and adopted the scientific methods, which had been used with such success in England. Their enthusiasm also led them to conduct experiments of their own, resulting in the development of German agricultural science which is so well known.

The very evident necessity for consideration of history in relation to agricultural science is thus clearly established, but, if any further evidence was wanted, it would only be necessary to cite the work of Arthur Young.³ The history he wrote was contemporary, but it cannot be described as anything else. In the course of his travels he examined and recorded divergent practices all over England and Wales, in France, in Ireland, and in Italy, and what he recorded was the inspiration of many of our most valuable and interesting experiments.

Again, the application of the chemical discoveries of the eighteenth century to agriculture was made possible by the work and lectures of John Humphries, and it was only when the intensive period of the enclosure movement had come to an end that it was found practicable for a sufficient number of large farmers to adopt the system of artificial manuring and careful cultivation he advocated.

On the face of it, perhaps the least important type of historical investigation is that which deals with the statistics of production, population, and so on. Statistics are notoriously difficult to understand, and uninteresting, but they can be made of human interest, and they can indicate what progress has been made and afford some kind of indication of why it has been made, if they are properly applied. Common observation is responsible for a large number of statements which can only be checked by the progress of historical investigation, and very frequently the results of common observation are found to be erroneous. Ultimately science depends almost entirely upon historical method.

³ See G. E. Fussell, "My Impressions of Arthur Young," *ibid.*, 17:135-144 (July 1943).

NEWS NOTES AND COMMENTS

PLANTATION LIFE IN ANTE-BELLUM LOUISIANA

Edwin A. Davis' *Plantation Life in the Florida Parishes of Louisiana, 1836-1846, as Reflected in the Diary of Bennet H. Barrow* (New York, Columbia University Press, 1943, 457 p.) is a valuable addition to an essential type of literature. Plantation diaries and journals must necessarily furnish historians with much of the information they require in writing about the slavery regime of the Old South. In no other way can they uncover as well the actual functioning of the plantation system.

The first part of the book presents the conclusions that Davis drew from his study of Barrow's diary. The diary itself is presented with a minimum of editing. Most of Barrow's entries in his diary were very brief, the most frequent comments being about the weather and the illness of various members of the plantation group—white and slave. From the pages of the diary emerge an interesting personality and an even more engrossing picture of plantation life.

Bennet H. Barrow seems to have lived a life typical of his station. He managed his plantation personally most of the time. His experience with overseers made him distrust them, and he preferred to supervise his slaves himself. Although the plantation produced good crops most years, the owner was almost constantly in debt, at least in part because he signed a good many notes for friends who proved untrustworthy. He found recreation and entertainment in occasional balls at which he danced all night, in frequent hunting excursions, and in extended trips to New Orleans. Usually, when he went to New Orleans he entered his horses in the races. He was kindly and affectionate with his family.

The slaves on the Barrow plantation, on the whole, were well treated. He frequently commended them individually and as a group. However, sometimes he resorted to a general whipping when their work did not come up to his expectations. The slaves were well fed, comfortably housed, and given adequate medical attention. Occasionally they were allowed a holiday and Christmas was always a festive time.

The several appendices by Davis contain some interesting data, concerning the Barrow family history, accounts, and inventories of the plantation. There are also a glossary of unfamiliar terms and a

bibliography. There is no index, but due to the fact that there are many unidentified names in the diary, perhaps an index would have been of little value.

It is impossible to give any adequate account of the numerous incidents related in the Barrow diary. The real significance of the journal lies in the multitude of minute details which give a day-by-day picture of a plantation in operation.—*George C. Osborn.*

BROWNE'S "SOURCE BOOK OF AGRICULTURAL CHEMISTRY"

Dr. Charles A. Browne's volume entitled *A Source Book of Agricultural Chemistry* (*Chronica Botanica*, v. 8, no. 1, Waltham, Mass., Chronica Botanica Co., 1944, 290 p., illus. \$5.00) is one of the most interesting and valuable contributions to the field of agricultural history in recent years. The subject itself is of great importance, and the eminence of the author both as a chemist and as a historian of science insured a thorough and competent treatment. The method of presentation is also noteworthy.

The volume summarizes the origins of agricultural chemistry and delineates the relationships of Justus von Liebig's work to that of his predecessors. Beginning with Thales (about 640-546 B.C.), the ideas and contributions of the philosophers and scientists who qualify as agricultural chemists are considered in historical sequence. Each figure is placed in perspective with reference to the prevailing beliefs of his time and to the development of the field of agricultural chemistry as a whole.

In presenting his subject, Dr. Browne chose to let Liebig's predecessors "in selected passages give their own accounts of the work selected for description, with no attempts at modernization of language." The result is that the reader can sample the flavor, style, and logic of this particular group of pioneers in science and thus contact the grassroots of the subject.

The illustrations consisting of reproductions of diagrams, tables, apparatus, and title pages of the original works consulted add much to the value of the study. Following the treatment of each scientist, his pertinent works and references concerning him are cited. The addendum provides scholarly appraisals of "Some References to the History of Agricultural Chemistry in the Century 1840-1940."

Much has been said about the importance of demonstrating the educational and intellectual value of science history. Dr. Browne's volume accomplishes this objective and is an eminent example of what is needed for all agricultural sciences.—*Everett E. Edwards.*